Vol. 988 Number 2

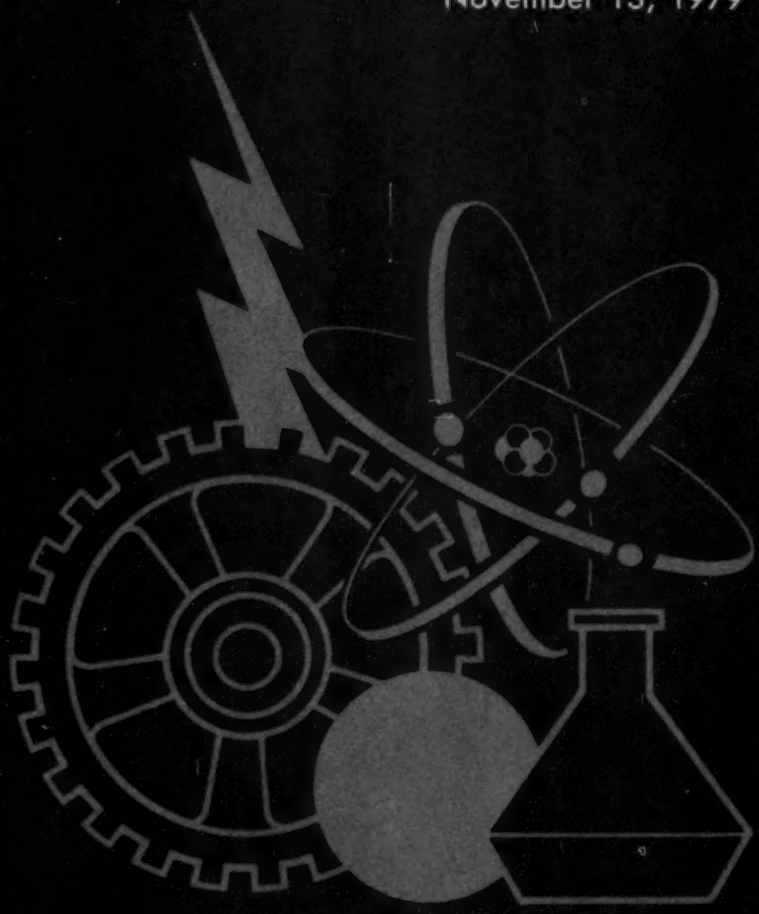
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 13, 1979



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

November 13, 1979 Volume 988 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,072, Re. S.N. 055,607, Filed Jul. 9, 1979, Cl. 114/222, METHOD OF PROTECTING THE HULLS OF MARINE VESSELS FROM FOULING, Klaus Zondek, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 315

3,414,928, Re. S.N. 064,382, Filed Aug. 6, 1979, Cl. 15/118, COMBINATION SPONGE AND SCOURER, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 242

3,835,175, Re. S.N. 062,571, Filed Jul. 31, 1979, Cl. 260/463, 9-FLUORENYLMETHANOL HALOFORMATES, CARBONATES AND THIOCARBONATES, Louis A. Carpino, et al., Owner of Record: *Research Corporation, New York, N.Y.,* Attorney or Agent: Henry T. Burke, Ex. Gp.: 223

3,899,025, Re. S.N. 064,333, Filed Aug. 6, 1979, Cl. 166/117.5, PUMP DOWN SYSTEM FOR PLACING AND RETRIEVING SUBSURFACE WELL EQUIPMENT, Robert W. Dinning, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: David L. Moseley, et al., Ex. Gp.: 354

4,026,167, Re. S.N. 044,307, Filed May 31, 1979, Cl. 74/785, PLANETARY TRANSMISSION, James M. Archer, Owner of Record: *Inventor,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 352

4,029,774, Re. S.N. 064,335, Filed Aug. 6, 1979, Cl. 424/216, O,S-DIALKYL O-PHENYLTHIO-PHENYL PHOSPHOROTHIOLATES/PHOSPHORODITHIOATES AND THEIR DERIVATIVES AND PESTICIDAL USE, William S. Hurt, Owner of Record: *Rohm & Haas Co., Philadelphia, Pa.,* Attorney or Agent: Robert A. Doherty, et al., Ex. Gp.: 125

4,037,621, Re. S.N. 059,040, Filed Jul. 19, 1979, Cl. 137/596.13, LOAD RESPONSIVE VALVE WITH CONSTANT LEAKAGE DEVICE, Tadeusz Budzich, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 341

4,039,098, Re. S.N. 062,883, Filed Aug. 1, 1979, Cl. 220/452, THERMAL INSULATION JACKET FOR WATER HEATERS, Kenneth M. Stilts, Owner of Record: *Inventor,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 241

4,040,093, Re. S.N. 062,984, Filed Aug. 2, 1979, Cl. 358/261, SYSTEM FOR CODING INFORMATION CHANGE PICTURE ELEMENTS IN FACSIMILE SIGNAL, Yukio Nakagome, et al., Owner of Record: *Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 233

4,040,796, Re. S.N. 064,432, Filed Aug. 7, 1979, Cl. 44/14, FAST LIGHTING ARTIFICIAL FIRELOG, George C. Vincent, et al., Owner of Record: *The Kingsford Company, Louisville, Ky.,* Attorney or Agent: Leonard Phillips, Ex. Gp.: 116

4,061,921, Re. S.N. 967,171, Filed Mar. 16, 1979, Cl. 205/423 P, INFRARED LASER SYSTEM, Cyrus D. Cantrell, et al., Owner of Record: *The United States of America as represented by The United States Atomic Energy Commission, Washington, D.C.,* Attorney or Agent: James E. Denny, et al., Ex. Gp.: 256

4,072,204, Re. S.N. 059,035, Filed Jul. 19, 1979, Cl. 180/34, CYCLE GEAR SELECTOR, Peter W. Leighton, et al., Owner of Record: *Lucas Industries Limited, Birmingham, England,* Attorney or Agent: John C. Holman, et al., Ex. Gp.: 316

4,085,705, Re. S.N. 062,231, Filed Jul. 30, 1979, Cl. 119/17, ANIMAL CAGE, Thomas M. Gland, et al., Owner of Record: *Eli Lilly and Company, Indianapolis, Ind.,* Attorney or Agent: Thomas P. Jenkins, et al., Ex. Gp.: 333

4,095,589, Re. S.N. 049,060, Filed Jun. 18, 1979, Cl. 128/2 E, COMBINATION URINE METER AND DRAINAGE RECEPTACLE, James G. Manschot, et al., Owner of Record: *Plastronics, Inc., Milwaukee, Wis.,* Attorney or Agent: Paul R. Puerner, Ex. Gp.: 335

4,113,016, Re. S.N. 062,014, Filed Jul. 30, 1979, Cl. 166/297, CASING PERFORATION METHOD AND APPARATUS, Donald E. Trott, Owner of Record: *Inventor,* Attorney or Agent: D. Carl Richards, et al., Ex. Gp.: 354

4,114,838, Re. S.N. 045,280, Filed Jun. 4, 1979, Cl. 224/45 S, CARRIER FOR SKIS AND SKI POLES, James E. Knauf, Owner of Record: *Inventor,* Attorney or Agent: William G. Anderson, et al., Ex. Gp.: 311

4,118,262, Re. S.N. 059,728, Filed Jul. 23, 1979, Cl. 156/175, LONGITUDINAL LOAD CARRYING METHOD FOR FIBER REINFORCED FILAMENT WOUND STRUCTURES, Harry Thomas Abbott, Owner of Record: *Brunswick Corporation, Skokie, Ill.,* Attorney or Agent: John L. Isaac, et al., Ex. Gp.: 161

4,121,856, Re. S.N. 060,615, Filed Jul. 25, 1979, Cl. 282/1 R, IDENTIFICATION ASSEMBLY AND METHOD, Jerome J. Brunette, Owner of Record: *Inventor,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 322

4,142,863, Re. S.N. 058,986, Filed Jul. 20, 1979, Cl. 422/63, ARTICLE CONTAINER FOR DISPENSING REAGENT SLIDES, Roger G. Covington, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: James A. Smith, et al., Ex. Gp.: 171

4,152,946, Re. S.N. 048,182, Filed Jun. 13, 1979, Cl. 74/193, TRANSMISSION DEVICES, Yves J. Kemper, Owner of Record: *Vacletec Corporation, Troy, Mich.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 352

4,156,220, Re. S.N. 059,056, Filed Jul. 19, 1979, Cl. 335/262, STARTER SOLENOID, Alfred B. Mazzorana, Owner of Record: *Societe de Paris et du Rhone, Rhone, France,* Attorney or Agent: Alvin Browdy, Ex. Gp.: 212

PATENT NOTICES

Certificates of Correction for the Week of Nov. 13, 1979

Plt. 4,197	4,133,194	4,156.946	4,163,194
Plt. 4,201	4,134,068	4,156,963	4,163,367
Re. 30,040	4,134,393	4,157,035	4,163,371
Re. 30,066	4,134,877	4,157,109	4,163,581
3,876,446	4,139,639	4,157,263	4,163,619
3,898,438	4,142,522	4,157,492	4,163,672
3,979,300	4,144,282	4,158,354	4,163,673
4,007,177	4,144,321	4,158,370	4,163,796
4,007,271	4,144,478	4,158,396	4,163,797
4,010,438	4,145,100	4,158,459	4,163,798
4,011,211	4,145,300	4,158,617	4,163,831
4,016,055	4,145,397	4,158,621	4,163,907
4,018,803	4,145,968	4,158,738	4,164,332
4,026,163	4,148,923	4,158,875	4,164,404
4,043,467	4,149,152	4,159,302	4,164,537
4,043,805	4,151,053	4,159,401	4,164,554
4,062,678	4,151,401	4,159,445	4,164,573
4,074,436	4,151,546	4,159,582	4,164,603
4,075,862	4,151,869	4,159,827	4,164,615
4,086,637	4,152,364	4,159,925	4,164,648
4,095,177	4,152,798	4,160,258	4,164,841
4,097,498	4,153,399	4,160,839	4,164,890
4,099,547	4,153,487	4,160,924	4,165,105
4,099,940	4,153,879	4,160,985	4,165,257
4,100,272	4,154,701	4,161,106	4,165,323
4,107,151	4,155,321	4,161,397	4,165,351
4,107,313	4,155,971	4,161,537	4,165,388
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4,113,084	4,156,177	4,162,044	4,165,502
4,123,552	4,156,551	4,162,168	4,165,531
4,124,722	4,156,584	4,162,363	4,165,604
4,124,843	4,156,609	4,162,444	4,165,698
4,128,899	4,156,634	4,162,521	4,165,775
4,129,008	4,156,644	4,162,684	4,165,810
4,129,416	4,156,654	4,162,688	4,166,857
4,131,632	4,156,802	4,162,694	4,167,022
4,132,152	4,156,845	4,162,946	4,167,637
4,133,182	4,156,880	4,163,077	4,167,688

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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 230—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents..... Numbers 2,155 to 2,159, inclusive

REISSUES

NOVEMBER 13, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,143
ROTATION SCREEN PRINTING MACHINE AND SQUEEGEE DEVICE

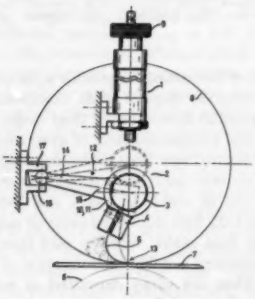
Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands

Original No. 3,933,093, dated Jan. 20, 1976, Ser. No. 383,155, Jul. 27, 1973. Continuation-in-part of Ser. No. 811,787, Apr. 1, 1969, abandoned. Application for reissue May 21, 1976, Ser. No. 688,614

Claims priority, application Netherlands, Apr. 25, 1968, 6805845

Int. Cl.[2] B41L *13/04*

U.S. Cl. 101—120 **6 Claims**



1. A rotary screen printing machine having a frame, supporting members for the ends of one or more cylindrical stencils and with suspension members mounted on the frame for a squeegee device disposed within the stencil and consisting of a squeegee holder with a fitting for a flexible squeegee blade, and with means for guiding the material to be printed; the improvement consisting in that the squeegee blade consists of a thin flexible metal strip, the thickness of which is less than 1% of the width of the portion of the strip which freely protrudes from the fitting, said squeegee holder being supported at least on one end by suspension members and the squeegee blade with its fitting being supported by the squeegee holder [at two spaced locations], the suspension members of each squeegee holder comprising means for adjusting the height of the squeegee blade within the stencil, and further comprising means connecting the squeegee holder with the frame and permitting displacement of the holder in a generally horizontal direction, parallel to the guiding direction of the material to be printed during the adjustment for height, in such manner that the pressure area of the squeegee blade is situated permanently in a substantially fixed desired zone of the stencil.

Re. 30,144
APPARATUS FOR SPIN FLANGING CONTAINERS

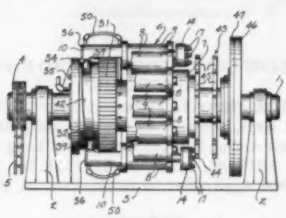
Andrew Gnyp, and Karl Elert, both of Brookfield, Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Original No. 4,018,176, dated Apr. 19, 1977, Ser. No. 304,093, Nov. 6, 1972. Application for reissue Apr. 6, 1978, Ser. No. 894,237

Int. Cl.[2] B21D *51/00*

U.S. Cl. 113—16 **3 Claims**

1. A machine for spin flanging the open ends of containers comprising, a supporting structure, a drive shaft mounted for rotation with respect to the supporting structure, a turret secured to the drive shaft and disposed to rotate with the drive shaft, container holding means carried by the turret for holding the containers during the spin flanging operation, a series of flanging heads carried by the turret, each flanging head being mounted for rotation about its axis and being mounted for reciprocating axial movement with respect to the turret, a fixed drive gear mounted on the supporting structure and disposed concentrically of said drive shaft, each flanging head including a series of circumferentially spaced freely rotatable flanging rollers disposed to engage the open end of the container to flange the same, a pinion connected to each flanging head and operably engaged with said gear to rotate the flanging heads about their axes as the turret rotates, each pinion and the respective gear having substantially different axial lengths to enable the pinion to move axially with respect to the gear and maintain a driving connection therebetween when the head is moved axially with respect to the turret, cam means interconnecting each flanging head and the supporting structure for moving the flanging heads axially with respect to the turret in programmed sequence to thereby move the heads toward and away from the containers being held by said container holding means, gas supply means for introducing a gas under pressure through each flanging head and into the interior of the container to aid in stripping the container from the flanging head as the head is moved away from the container after the flanging operation, each flanging head includes a flanging head shaft journalled with respect to the turret, said gas supply means includes a chamber in said turret and communicating with a source of gas under pressure, and a passage located axially of each flanging head shaft and communicating with said chamber for conducting gas to the interior of each container.



Re. 30,145
ENERGY GENERATING SYSTEM

Ronald I. Papineau, Goshen, Mass., assignor to Unique Energy Systems, Inc., Amherst, Mass.

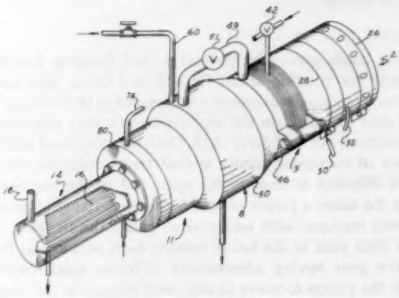
Original No. 3,967,589, dated Jul. 6, 1976, Ser. No. 544,400, Jan. 27, 1975. Application for reissue Jun. 30, 1978, Ser. No. 920,859

Int. Cl.[2] F22B *1/00*

U.S. Cl. 122—4 R **11 Claims**

1. Energy generating system comprising a steam generator, a combustion chamber, fuel supply means for introducing a combustible mixture into said chamber, means for supplying water to said generator for conversion to steam by combustion of said mixture, *means connected to said steam generator means for further heating and activating said steam by combustion of said mixture to form gases* feed means for supplying said *gases from such further heated and activated* steam to an asymmetric microporous membrane which produces hydrogen by [chemi-

cal disassociation of said steam,] *diffusion of hydrogen therethrough from said gases* and conduit means for supplying at least



part of the hydrogen gas so produced to said combustion chamber for maintaining combustion therein.

Re. 30,146

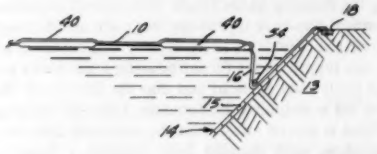
FLOATING COVER FOR A LIQUID STORAGE RESERVOIR

Howard S. Dial; Henry L. Habegger, both of Placentia, and William B. Kays, Whittier, all of Calif., assignors to Howard D. Webb and Arthur M. Lockhart, both of Long Beach, Calif.

Original No. 3,313,443, dated Apr. 11, 1967, Ser. No. 378,469, Jun. 26, 1964. Application for reissue Dec. 26, 1978, Ser. No. 973,371

Int. Cl.[2] B65D *87/18*

U.S. Cl. 220—219 **10 Claims**



5. Apparatus for preventing contamination of the stored liquid in an open reservoir, comprising:

a continuous sheet of flexible, relatively thin material impervious to and completely overlying said liquid in coextensive relationship to the periphery of said reservoir, the size of said sheet being greater than the area encompassed by the upper periphery of said reservoir;

anchor means securing the outer periphery of said sheet to the upper periphery of said reservoir in fluid-tight relationship therewith;

and float means on said sheet spaced inwardly from the upper periphery of said reservoir to raise and lower said sheet on the surface of said liquid as the level thereof varies, with said float means supporting the area of said sheet engaged by said float means at a higher elevation than the *peripheral* portion of said sheet spaced outwardly of said float means and inwardly of said anchor means whereby said *peripheral* portion forms a depending rainwater collection sump, *said float means comprising a plurality of float units arranged across the central portion of said sheet bounded by said peripheral portion, at least some of said float units being spaced apart to define paths for rain water to flow from said central portion toward said peripheral portion, said peripheral portion being unsupported by said float means whereby said peripheral portion is adapted to sink below the level of said central portion of said sheet to form said sump.*

Re. 30,147

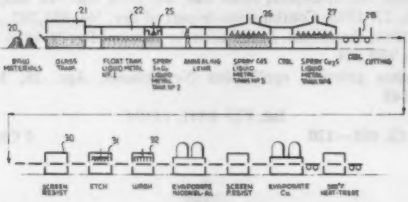
METHOD OF COATING A GLASS RIBBON ON A LIQUID FLOAT BATH

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Original No. 3,880,633, dated Apr. 29, 1975, Ser. No. 431,705, Jan. 8, 1974. Application for reissue Apr. 28, 1977, Ser. No. 791,737

Int. Cl.[2] C03B *18/00*; C03C *17/10*

U.S. Cl. 65—60 A **13 Claims**



1. A method of fabricating large scale solar cells, comprising moving a continuous strip of glass continuously in a path containing sequential heated liquid float tanks, and forming a SnO_X film on said continuous strip of glass during traverse of said strip of a first of said float tanks, forming a film of CdS microcrystals on said SnO_X film during traverse of said strip through a second of said float tanks, and forming a film of Cu_2S over said CdS film during traverse of said strip through a third of said float tanks, wherein said float tanks contain liquid at temperatures suitable for formation of said films, and wherein said films are spray deposited at rates selected to enable said liquid in said float tanks to maintain the temperatures of the surfaces of said strip of glass constant during the forming of said films.

Re. 30,148

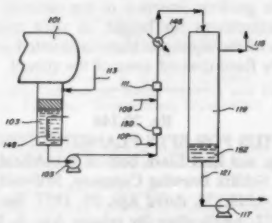
MELT FINISHING PROCESS FOR POLYMERS PRODUCED BY VAPOR STATE POLYMERIZATION PROCESSES

James L. Jezl, Winfield, and Edwin F. Peters, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Original No. 3,970,611, dated Jul. 20, 1976, Ser. No. 533,022, Dec. 16, 1974. Application for reissue Jul. 17, 1978, Ser. No. 925,605

Int. Cl.[2] C08F *2/34, 6/00, 10/00, 14/06*

U.S. Cl. 526—65 **22 Claims**



1. A process for treating polymer made by the polymerization of at least one polymerizable monomer in a vapor state reactor comprising removing without substantial pressure letdown solid polymer from said vapor state reactor together with reactor off-gases into a post polymerization zone into which a controlled amount of said monomer is introduced and wherein a controlled amount of essentially adiabatic polymerization occurs and said polymer is melted by heat from said

adiabatic polymerization and externally added heat to form efficiently transferable, molten polymer.

Re. 30,149

PREPARATION OF ANTIFIBRINOLYTICALLY ACTIVE ISOMER OF 4-AMINOMETHYLCYCLOHEXANE CARBOXYLIC ACID

Bengt O. Melander; Gunnar Hanshoff, both of Stockholm; Bengt R. G. Granstrand, Vallentuna, and Berit M. Olsson, Trangsund, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Original No. 3,574,721, dated Apr. 13, 1971, Ser. No. 417,235, Dec. 9, 1964. Application for reissue Jan. 30, 1979, Ser. No. 7,717

Claims priority, application Sweden, Dec. 17, 1963, 14085/63

Int. Cl.[2] C07C *101/04*

U.S. Cl. 562—507 **4 Claims**

1. The method of preparing the 4-aminomethyl-cyclohexane carboxylic acid isomer which in substantially pure state assays at least about 90 percent antifibrinolytically active material, which method comprises reacting the 4-aminomethyl-cyclohexane methanol isomer melting at 118° C., in an inert solvent for it and the presence of sufficient alkali metal carbonate to neutralize later formed hydrogen halide, with sufficient benzoyl halide dissolved in an inert solvent for it, and while cooling, to benzoylate its amino group, heating the reaction mixture until substantially complete benzoylation of said group occurs; recovering the resulting 4-benzoylaminomethyl-cyclohexane methanol and admixing it with water and sufficient alkali metal hydroxide to provide oxidizing conditions, adding sufficient of a compatible oxidizing agent to oxidize the methanol group to the carboxylic acid group while controlling the temperature below about 40° C. until substantial completion of the oxidation; removing the resulting 4-benzoylaminomethyl-cyclohexane carboxylic acid from the reaction mixture, heating it with sufficient mineral acid to split off the benzoyl group; and separating the resulting 4-aminomethyl-cyclohexane carboxylic acid antifibrinolytically active isomer.

Re. 30,150

INDUCTOR DRIVE MEANS

John M. Puvogel, West Alexandria, Ohio, assignor to NCR Corporation, Dayton, Ohio

Original No. 3,708,726, dated Jan. 2, 1973, Ser. No. 168,052, Aug. 2, 1971. Application for reissue Nov. 13, 1978, Ser. No. 960,131

Int. Cl.[2] H01H *47/22*

U.S. Cl. 361—152 **10 Claims**

1. In combination with an inductive load having a two-terminal winding, a driving circuit for energizing said winding comprising, in combination,

a direct current voltage supply having two terminals;

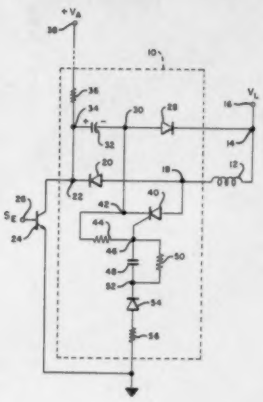
means connecting a first one of the terminals of the winding to a first one of the terminals of the direct current voltage supply;

energy storage means having two terminals;

means including a unidirectional conducting device connecting a first one of the terminals of the energy storage means to said first terminal of said winding;

means including a unidirectional conducting device connecting the second of the terminals of the winding to the second terminal of the energy storage means;

switching means for controlling the state of energization of the winding, said switching means having a first terminal connected to said second terminal of said energy storage means and a second terminal connected to the second terminal of said direct current voltage supply;



signal translating means having a first terminal connected to said second terminal of said winding, a second terminal connected to said first terminal of said energy storage means, and a control gate;

means for connecting said control gate to said second terminal of said voltage supply; and

means for connecting said control gate to said first terminal of said energy storage means; whereby deenergization of said winding under control of said switching means causes energy to be stored in said energy storage means, and whereby during subsequent re-energization of said winding under control of said switching means the energy stored in said energy storage means is applied to said winding through said signal translating means, which is rendered conducting at such time in response to the potential level at the first terminal of the energy storage means.

[illegible]

PLANT PATENTS

GRANTED NOVEMBER 13, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,480

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jul. 19, 1978, Ser. No. 925,989
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which are (A) medium to deep mauve-lavender in color (similar to the pollen parent 'Angel Face' — U.S. Plant Pat. No. 2,792), the bud and flower resembling 'Lavender Lace' miniature, U.S. Plant Pat. No. 2,991, in size and shape; and (B) further characterized by a plant which is vigorous and compact, easy to propagate from cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

4,481

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,992
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,482

CHRYSANTHEMUM NAMED GOLDEN BOUNTY

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 27, 1978, Ser. No. 963,883
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of standard chrysanthemum of the greenhouse cut flower type, substantially as herein shown and described, particularly characterized in uniqueness, when compared with its parent variety which has white blooms, by the medium yellow coloration of the blooms.

4,483

CHRYSANTHEMUM NAMED FREE SPIRIT

Kerry S. Petusky, West Chicago, Ill., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Nov. 28, 1978, Ser. No. 964,436
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of chrysanthemum pot plant, substantially as herein shown and described, particularly characterized in uniqueness, when compared with its parent "Spirit", by its quill-shaped ray florets which project in a radial fashion from an upstanding group of the inner or disc florets.

4,484

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Nov. 29, 1978, Ser. No. 964,497
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which resemble the miniature rose Kathy (U.S. Plant Pat. No. 3,246) in size and shape and are of a color resembling the variety Fire Princess, miniature (U.S. Plant Pat. No. 3,084); and further characterized by a plant of dwarf compact habit which is easy to propagate from cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

PATENTS

GRANTED NOV. 13, 1979

ERRATA

For CLASS	See PATENT NO.
433–098	4,173,827
433–087	4,173,828
062–324	4,173,865
141–032	4,174,004
141–054	4,174,005
141–087	4,174,006
141–001 R	4,174,007
151–069	4,174,008
165–045	4,174,009
430–068	4,174,215
430–257	4,174,216
430–317	4,174,217
430–306	4,174,218
430–321	4,174,219
430–613	4,174,220
430–225	4,174,221
430–190	4,174,222
208–011 LE	4,174,263
548–219	4,174,321
548–237	4,174,322
548–251	4,174,323
548–264	4,174,324
585–835	4,174,353
585–626	4,174,354
585–843	4,174,355
585–701	4,174,357
525–183	4,174,358
525–332	4,174,360
423–004	4,174,369
428–008	4,174,384
526–114	4,174,429
526–173	4,174,431
525–437	4,174,438
325–320	4,174,489

PATENTS

GRANTED NOVEMBER 13, 1979

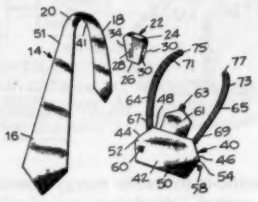
GENERAL AND MECHANICAL

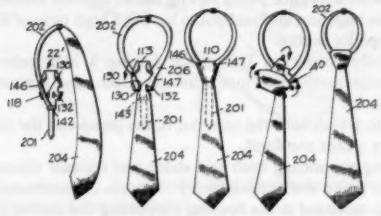
4,173,792

ADJUSTABLE LENGTH SIMULATED KNOTTED NECKTIE COMBINATION

Franklin S. Intengan, 666 W. 81 St., Apt. W-122, Hialeah, Fla. 33014

Filed Apr. 6, 1978, Ser. No. 894,187
Int. Cl.[2] A41D *25/02*
U.S. Cl. 2—144 **16 Claims**





1. A simulated knotted necktie combination for a wearer comprising:

a necktie length having a front display tail portion and a rear tail portion and an intermediate portion between the tail portions, said front display tail portion having a zone adjacent said intermediate portion,

a simulated knot shaped body comprising means to predetermine the size and shape of a simulated knot, said body having a top and side surfaces and a front surface, said body being of generally inverted trapezoidal form as seen in front elevation and said top surface comprising a necktie length support when said necktie length is arranged with the zone of said front display tail overlaying said front surface of said simulated knot shaped body and the front display tail portion and rear tail portions extend in a common direction from the body and away from the top body surface; and

shield means comprising means to slidably connect the necktie length to the simulated knot shaped body and to orient and hold the zone of the length in a simulated knot shape, said shield comprising

a panel having spaced upper and lower edges,

said panel being sized to cover the front face of said body,

said panel having wrap around side flaps between the upper and lower edges to cover the side surfaces of the body,

said panel being positionable over said front face of said body and zone of the necktie length covering said front face and

said flaps including connector means to interengage with one another to slidably captivate the display tail of the necktie length to the body with said zone overlaying the front face of said body and

said shield including a cover flap extending from the upper shield edge sized to cover the top surface of the body and including means to connect the cover flap to the flaps of the shield, and

neckband means included in said combination for connection of the simulated knotted necktie combination about the neck of a wearer.

4,173,793

KNOT RETAINING IMPLEMENT FOR NECKTIE OR SCARF

Yasui Kazuo, No. 2-3-813, 3-chome, Taishibashi, Asahi-ku, Osaka, Japan

Filed Mar. 28, 1978, Ser. No. 891,113
Claims priority, application Japan, Apr. 11, 1977, 52-45387; Jul. 9, 1977, 52-91332; Jul. 9, 1977, 52-91333; Oct. 31, 1977, 52-146558; Dec. 2, 1977, 52-162313; Dec. 2, 1977, 52-162314
Int. Cl.[2] A41D *25/14*
U.S. Cl. 2—152 A **4 Claims**

1. A knot retaining implement for a necktie and a scarf comprising:

a substantially V-shaped wire retaining portion;

a hook portion integrally formed with and extending backwardly from the ends of said V-shaped portion;

a single looped chain for fitting around said tie connected to said hook portion and extending therefrom;

a slidable ring fitted around the outside of said chain; and

a stop connected to said chain, whereby positioning said tie through said chain with said stop in front of said tie and lowering said slide ring on said chain folds said tie between said stop and said ring.

4,173,794

BUCKLELESS BELT

Richard D. E. Nichols, Fallbrook, Calif., assignor to Bianchi Leather Products, Inc., Temecula, Calif.

Filed Aug. 4, 1977, Ser. No. 821,912
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—322 **5 Claims**

1. A buckleless belt comprising of a belt body constituting an elongated strip of leather or leather like material and having an outer face, an inner face and a pair of generally parallel edges;

fastener means secured to the inner face of one end region of said belt body;

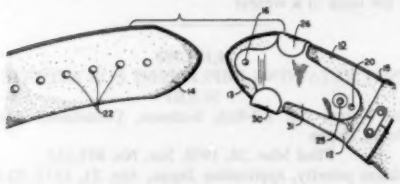
said fastener means including a fastening device extending outward from the inner face of said belt body;

said belt body in the region of the opposite end from said belt body including a plurality of integral apertures for engagement with said fastening means; and

retaining means engaging said belt body for holding regions

in fastening engagement wherein said one end region presents substantially no visible fastener means when worn by a person;

wherein said fastener means includes a plate member secured to the inner face of said body and positioning and supporting said pin fastening device in a position extending generally normal to the surface of said plate; and



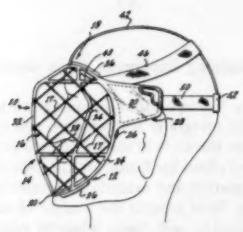
wherein said plate includes integral reentrant arms defining a channel of size to receive the said opposite end of said belt body therein, said reentrant arms including tabs allowing longitudinal movement of said opposite end of said belt while restricting upward or downward movement thereof when worn by a person; said tabs constituting vertually the only portion of said fastener means visible when worn by a person.

4,173,795

RACQUETBALL OR SQUASH SAFETY MASK

Alyce Lundin, 11235 Constellation Dr., and Robert V. Bravin, 1576 Wagner Dr., both of El Cajon, Calif. 92020

Filed Jul. 27, 1978, Ser. No. 928,374
Int. Cl.[2] A42B *1/08;* A63B *71/10*
U.S. Cl. 2—425 **7 Claims**



1. A racquetball or squash safety mask comprising: a primary framework assembly and a secondary framework assembly;

said primary framework assembly having a top framework member, a bottom framework member, and a pair of side framework members that function to form a base for the secondary framework assembly and also to support the safety mask upon the wearer's face:

said secondary framework assembly is attached to said primary framework assembly and it forms a convex frame that extends outwardly from said primary framework assembly and,

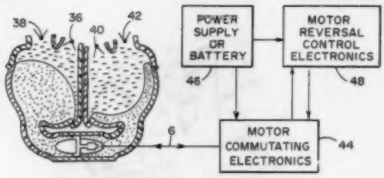
a grid network covering said secondary framework assembly, said grid network comprising a plurality of filaments criss-crossing each other with their ends secured to said primary framework assembly, said filaments of said grid network being laterally spaced apart a distance greater than one inch but less than two inches, said filaments of said grid network being diagonally oriented with respect to the front of said mask such that none of the filaments lie in a vertical plane thereby minimizing the amount of impairment of the wearer's vision.

4,173,796

TOTAL ARTIFICIAL HEARTS AND CARDIAC ASSIST DEVICES POWERED AND CONTROLLED BY REVERSIBLE ELECTROHYDRAULIC ENERGY CONVERTERS

Robert K. Jarvik, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Dec. 9, 1977, Ser. No. 858,921
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.7 **11 Claims**



1. An electric-to-hydraulic energy conversion system to actuate and control a diaphragm, sac or axisymmetric blood pump for use in a total artificial heart or cardiac assist system comprising:

a reversible hydraulic pump having stator, diffusor elements, and an impellor, and said pump having a high ratio of flow to impellor inertia,

a reversible brushless DC motor having a high ratio of power to inertia, said motor having a rotor and stationary elements,

a shaft to which both the impellor of the pump and the rotor of the motor are fixed,

a housing supporting both said stator and diffusor elements of the pump and the stationary elements of the motor,

bearings mounted in the housing supporting the assembly of shaft, motor rotor, and pump impellor for rotation,

means for reversing said motor to alternately cause systolic and diastolic action of the artificial heart, and

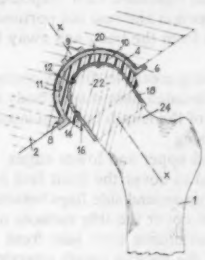
means for controlling said motor reversing means.

4,173,797

PROSTHESIS FOR ARTHROPLASTY OF THE HIP

Frantz Langlais, and Michel Postel, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Aug. 17, 1977, Ser. No. 825,384
Claims priority, application France, Aug. 19, 1976, 76 25215
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.912 **8 Claims**



1. A prosthesis for arthroplasty of the hip, which comprises:

a thin metal cotyloid cup of hemispherical shape to be fitted in the cotyloid cavity and having an outer surface which has dimensions substantially equal to those of the cotyloid cavity and having a peripheral flange for abutting on bone

around the cotyloid cavity for preventing the cup from pivoting relative to cotyloid cavity;

a thin femoral cup of metal having a cylindrical skirt portion to be fitted on the head of the femur;

and an intermediate cup of plastics material which is thicker than said cotyloid cup and said femoral cup and has a part-spherical outer surface which is such that when the intermediate cup is mounted in the cotyloid cup it is capable of swivelling in all directions relative to the cotyloid cup, the intermediate cup having an inner surface which comprises a cylindrical portion which fits coaxially on the cylindrical skirt portion of the femoral cup so as to allow the femoral cup only a movement of rotation about the common axis of the skirt portion and cylindrical portion.

4,173,798

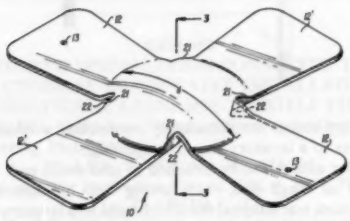
INTRA-OCULAR LENS

Robert C. Welsh, 168 SE. First St., Miami, Fla. 33131

Filed May 4, 1978, Ser. No. 902,830

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 **5 Claims**



1. An iris plane intra-ocular lens for implantation into an aphakic human eye, comprising:

a central lens area from which four haptics extend generally along two perpendicular lines, two of said haptics being vertical haptics extending upwardly and downwardly, respectively, from said central lens area, and the other two haptics extending horizontally from the sides of said central lens area, said vertical haptics for sitting behind the iris of an aphakic human eye into which the lens is implanted and said horizontal haptics for sitting in front of said iris but behind the cornea of said eye,

each junction region among each two adjacent haptics and the central lens area being a haptic crotch, the posterior side of the lens being substantially flat, with the posterior side of each edge of the horizontal haptics being substantially chamfered in each haptic crotch, for minimizing warping of the iris of said eye at its pupillary margin.

4,173,799

WATER LEVEL CONTROLLER FOR SWIMMING POOL GUTTER

James A. Patterson, 2375 Valleyview Dr., Columbus, Ohio 43204

Filed Jul. 3, 1975, Ser. No. 592,950

Int. Cl.[2] E04H *3/20*

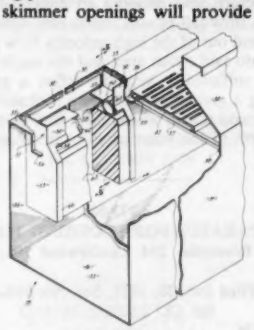
U.S. Cl. 4—172.17 **8 Claims**

1. In a swimming pool having generally vertical walls, a gutter located on the top of said walls and extending around the perimeter of said pool, said gutter having a back wall, a bottom wall and an inner wall, a filter, means for supplying fresh water to said pool from said filter, and means connecting said gutter to said filter to return water from said pool to said filter, the improvement comprising,

a plurality of skimmer openings spaced around the perimeter of said pool and located in said inner gutter wall adjacent the top of said inner gutter wall,

means for closing each said opening, said closing means including a float located in said gutter and associated with each said opening, said float being located well below said skimmer opening and effecting the closing of said opening when the level of water in said gutter, lifting said float, rises to a level well below the said opening,

whereby during periods when the water in the pool is quiescent, said skimmer openings will provide a continuous



flow of water from said pool into said gutters and during periods of greater activity in said pool the flow of water over the sides of said pool will raise the level of water in said gutters sufficiently to close said skimmer openings, thereby creating greater gutter capacity to accommodate water surging over the inner wall of said gutter.

4,173,800

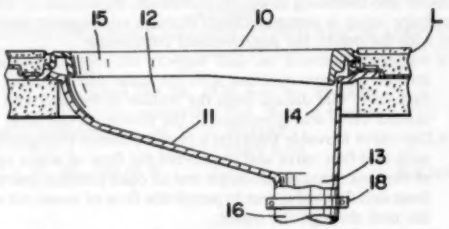
LOW-PROFILE SYPHON TRAP

George J. Flegel, Michigan City; Roger L. Mielbeck, LaPorte, and Patrick J. Pizarek, Michigan City, all of Ind., assignors to Josam Manufacturing Co., Michigan City, Ind.

Continuation-in-part of Ser. No. 827,065, Aug. 23, 1977, Pat. No. 4,130,907. This application Aug. 24, 1978, Ser. No. 936,354

Int. Cl.[2] E03C *1/00*

U.S. Cl. 4—207 **8 Claims**



1. In a syphon gas trap for a squat-type water closet, the combination of:

a tubular inlet area of circular cross-section extending substantially vertically downwardly and attachable to the waste discharge opening of a water closet,

a tubular gas-seal arm in rebent relationship to said inlet arm and extending divergently angularly upwardly at an acute angle to said inlet and,

said gas-seal arm having a substantially arcuate non-circular cross-section whose flow area is less than the flow area of said inlet arm,

the juncture of said inlet arm and said gas-seal arm defining the lower horizontal plane of a gas seal chamber of said trap when holding water,

a tubular outlet arm extending horizontally from the downstream end of said seal arm,

said outlet arm being of circular cross-section and having a flow area greater than that of the seal arm,

the juncture of the apex of the bottom portion of said seal arm and said outlet arm defining the upper horizontal plane of said gas-seal chamber,

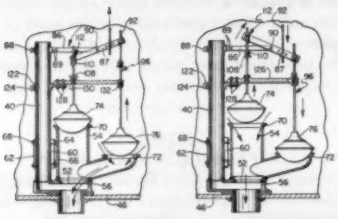
said juncture also defining an angular-downwardly directed flow-fall in said outlet arm downstream of said apex and out of the high velocity flow path of said seal arm into said outlet arm, and the angle of said seal arm being sufficiently large to define a gas-seal chamber having a greater volume than a chamber disposed between said planes would have in a vertically extending seal arm of the same cross-sectional area as said inlet arm.

4,173,801

APPARATUS FOR FLUSHING TOILETS

Nicholas P. Bresnyan, 214 Candlewood Rd., Groton, Conn. 06340

Filed Jun. 23, 1978, Ser. No. 918,679
Int. Cl.[2] E03D *1/14, 3/12*
U.S. Cl. 4—326 **12 Claims**



1. In combination with a toilet including a tank capable of being filled with water having a bottom and sidewalls, a hollow support member mounted on the tank including structure defining an outlet at the bottom of the tank for draining water therefrom, and a hollow standpipe mounted on said support member and extending upwardly therefrom, the interior of said standpipe being in communication through said support member with the outlet, the improvement comprising:

a manifold mounted on said support member having an interior in communication with the outlet and including a first valve seat distant from the bottom of the tank and a second valve seat proximate to the bottom of the tank;

a first valve movable between a closed position engageable with said first valve seat to prevent the flow of water out of the tank through the outlet and an open position spaced from said first valve seat to permit the flow of water out of the tank through the outlet;

a second valve movable between a closed position engageable with said second valve seat to prevent the flow of water out of the tank through the outlet and an open position spaced from said second valve seat to permit the flow of water out of the tank through the outlet;

a handle pivotally mounted on a sidewall of the tank;

a first actuating lever fixed at one end to said handle;

a second actuating lever;

a cantilevered member lying generally in a plane of said first actuating lever and mounted on said standpipe and extending outwardly therefrom;

pivot means rotatably mounting said second actuating lever on said cantilevered member at a location distant from the standpipe;

a link pivotally connecting said first and second actuating levers;

first lift wire means pivotally connecting said first valve and said second actuating lever at one side of said pivot means; and

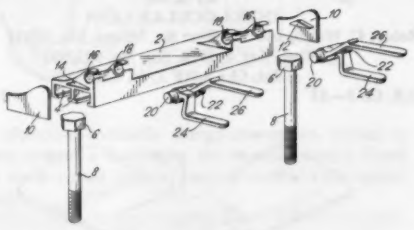
second lift wire means pivotally connecting said second valve and said second actuating lever at an opposite side of said pivot means whereby rotation of said handle in one direction serves to move said first valve to an open position while maintaining said second valve in a closed position, and rotation of said handle in the opposite direction serves to move said second valve to an open position while maintaining said first valve in a closed position.

4,173,802

TOILET SEAT

Karl-Erik Wikstrom, Bergkullavagen 6, S-330 20 Anderstorp, Sweden

Filed Mar. 16, 1978, Ser. No. 887,315
Int. Cl.[2] A47K *13/12*
U.S. Cl. 4—236 **1 Claim**



1. Hinge means for detachably connecting a lavatory seat and cover to a lavatory stool, comprising:

a holder adapted to be attached to said stool; and

a pair of hinge pins each having two brackets mounted thereon, one adapted for attachment to a lavatory seat and the other adapted for attachment to a lavatory cover,

said holder comprising two pairs of resiliently deformable recessed clips, each pair of clips being adapted detachably to receive one of said pins by pressing said one pin into said each pair of clips in a direction transverse to the hinge pin axis, and adapted to permit removal of said one pin from said each pair of clips by urging it outwardly of said each pair of clips in the opposite direction;

each of said clips having C-shaped walls with their openings facing in the same direction and each of said brackets having a bearing portion exceeding said pins in diameter;

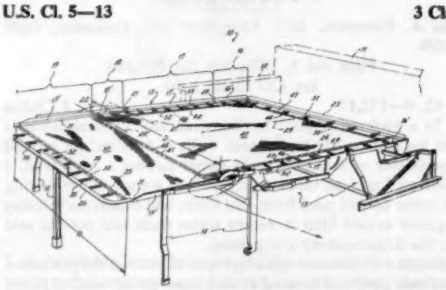
the axial spacing between the clips of each pair being substantially equal to the sum of the axial lengths of said bearing portions of the brackets retained by said pair of clips.

4,173,803

SOFA-SLEEPER

Ronald J. Kennedy, Ennis, Tex., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 27, 1978, Ser. No. 890,367
Int. Cl.[2] A47C *17/13*
U.S. Cl. 5—13 **3 Claims**



1. An improved sofa-sleeper structure comprising

a bed frame having a front bed frame section, and intermediate bed frame section, and a rear bed frame section, said front, intermediate, and rear sections being pivotable relative one to the other between a folded sofa attitude and a flat bed attitude,

a cloth front deck fixed to said front deck section, said cloth front deck being connected with the foot rail of said front deck section by a plurality of springs,

a cloth rear deck fixed to said rear deck section, said cloth rear deck being connected with the side rails of said rear deck section by a plurality of springs,

at least one stitch line fixedly connecting said cloth front deck to said cloth rear deck, said stitch line being disposed generally transverse to the longitudinal axis of said bed frame, and constituting the only direct connection between said front and rear cloth decks, and

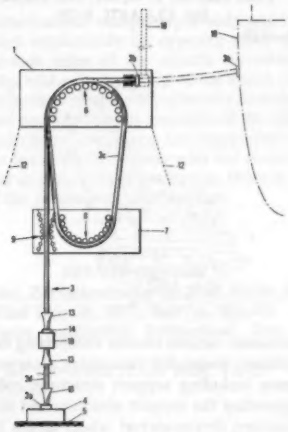
a tensioning device including a cloth flap connecting said intermediate deck frame section with the rear edge of said cloth front deck such that said tensioning device induces tension in said cloth front deck in a longitudinal direction relative to the longitudinal axis of the bed frame when said sofa sleeper structure is in the folded sofa attitude, and said tensioning device induces no tensioning in said cloth front deck when said sofa sleeper structure is in the bed attitude.

4,173,804

FLOATING INSTALLATION CONNECTED TO A STATIONARY UNDERWATER INSTALLATION THROUGH AT LEAST ONE FLEXIBLE PIPE

Xuong N. Duc, Malmaison, France, assignor to Institut Francais du Petrole, Malmaison, France

Filed Feb. 7, 1978, Ser. No. 875,792
Claims priority, application France, Feb. 9, 1977, 77 03833
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 P **15 Claims**



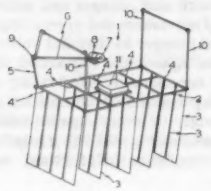
1. A floating installation comprising an element floating on the water surface, at least one flexible pipe having a first end secured to a point which is stationary with respect to the water bottom and having a second end secured to the floating element, the length of the flexible pipe being substantially greater than the distance of said stationary point from the water surface, automatic means maintaining said flexible pipe under substantially constant tension, irrespective of the external forces applied to the floating installation, said automatic tensioning means comprising a first direction reversing means carried by said floating element, an element of determined negative buoyancy corresponding to an apparent weight in water, a second direction reversing means carried by said element of negative buoyancy, said element of negative buoyancy being suspended from said floating element by means of flexible pipe which passes over said first and second direction reversing means forming at least one substantially full passing from one of said first and second direction reversing means to the other and back to said one of the direction reversing means with all curved portions of said flexible pipe having the same direction of curvature, so as to reduce wearing of said flexible pipe, before being secured to said floating element.

4,173,805

BRUSHES

Gordon H. Silcock, P.O. Box 26099, Auckland, New Zealand

Filed Jun. 8, 1976, Ser. No. 693,977
Int. Cl.[2] B60S *3/04*
U.S. Cl. 15—97 B **5 Claims**



1. A brush comprising:

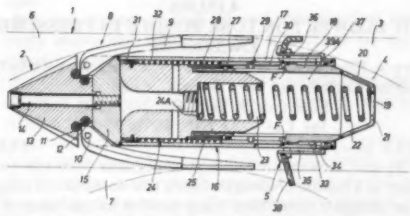
a frame member, a plurality of flexible straps fixed to said frame member and adapted to hang in a substantially vertical direction from said frame member, at least one arm pivoted to said frame member, said arm pivotally connected to a fixed member, said arm further including a pivot joint therein, and a pulse member for imparting a reciprocating motion to said at least one arm about said pivotal connection to said fixed member, said pulse member applying a force to said pivot joint on said arm between said fixed member pivot and said frame member pivot so that said frame member moves in a reciprocal fashion.

4,173,806

APPARATUS FOR CLEANING CONDUITS OR THE LIKE

Paul Hammelmann, Zum Sundern 17, D-4740 Oelde 1, Fed. Rep. of Germany

Filed Oct. 18, 1978, Ser. No. 952,539
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1977, 2746668; Apr. 26, 1978, 2818182
Int. Cl.[2] B08B *9/04*
U.S. Cl. 15—104.06 R **22 Claims**



1. Fluid-propelled apparatus for cleaning conduits of the type having an upstream portion adapted to be filled with a pressurized fluid and an open downstream portion, comprising a housing insertable into the conduit between said portions and including a component slidably engaging the internal surface of the conduit so that pressurized fluid acts upon said component and normally propels said housing forwardly until the housing is arrested or decelerated by an obstruction, if any, in said downstream portion, said housing having an internal space

communicating with said upstream portion and outlet means connecting said space with said downstream portion; valve means movable in said housing to and from an operative position in which said outlet means is sealed; first biasing means for urging said valve means to said operative position; at least one cutting tool mounted on said housing in front of said component and arranged to remove or break up the obstructions in said downstream portion on application of impacts to said housing; impeller means reciprocably mounted in said housing; a plunger reciprocably mounted in said housing behind said impeller means to move rearwardly under the action of pressurized fluid in said space on deceleration or stoppage of said housing and forwardly under the action of fluid pressure in said upstream portion when said space communicates with said downstream portion via said outlet means; second biasing means for urging said impeller means forwardly to impact against said housing; and means for respectively coupling said impeller means with said plunger and with said valve means prior to rearward movement and upon completion of rearward movement of said plunger so that said valve means leaves said operative position against the opposition of said first biasing means while said impeller moves forwardly under the action of said second biasing means upon completion of rearward movement of said plunger to impact against said housing and said first biasing means returns said valve means to said operative position upon completion of forward movement of said plunger.

4,173,807

CLEANING IMPLEMENT

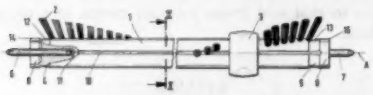
Siegfried Maier, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Dupro AG, Romanshorn, Switzerland

Filed Jun. 28, 1978, Ser. No. 919,940

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729266

Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—179 **16 Claims**



1. A rotatable shaft provided with bristles for a cleaning implement, especially vacuum cleaner, and having its ends designed for journalling in bearings, which comprises an annular depression at each end said shaft comprising at least one longitudinal groove extending parallel to the axis of said shaft, said longitudinal groove extending over the entire length of said shaft, including said depressions.

4,173,808

SOOT BLOWER FOR TUBE BUNDLE IN PRESSURIZED ENCLOSURE

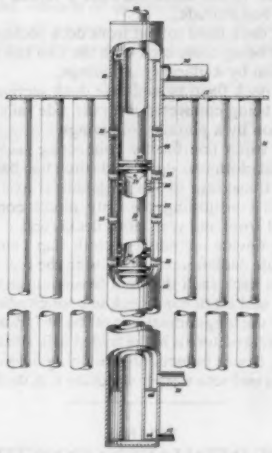
Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 5, 1979, Ser. No. 1,341

Int. Cl.[2] F23J *3/02*; F27D *23/00*

U.S. Cl. 15—316 R **8 Claims**

1. A soot blower for removal of deposits from the outside surface of a bundle of elongate tubes, said soot blower comprising an elongate outer tube lying parallel to the tubes of said tube bundle and having an apertured end and a closed end, an inlet duct for cooling fluid connected to one end of the outer tube and an outlet duct for cooling fluid connected to the opposite end of the outer tube, and intermediate tube positioned concentrically within the outer tube to define an annular cooling space connected to the inlet and outlet ducts, radial passageways extending between the intermediate and outer tubes to bridge the annular cooling space therebetween, a central soot blower tube axially movable within the intermediate tube having an inlet end thereof traversing the apertured end of the outer tube, a source of cleaning fluid connected to the inlet end of the soot blower tube, and radial openings in the soot blower tube adapted to coincide with the radial passageways that extend between the intermediate and outer tubes to project cleaning fluid radially therethrough when the soot blower tube is moved axially.



4,173,809

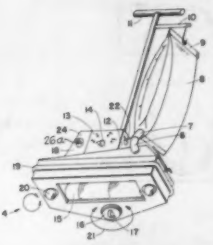
AUTOMATIC VACUUM CLEANER

Paul H. Ku, 47-50 59th St., Woodside, N.Y. 11377

Filed Jun. 30, 1978, Ser. No. 920,807

Int. Cl.[2] A47L *9/28*

U.S. Cl. 15—319 **2 Claims**



1. An automatic vacuum cleaner comprising in combination: a vacuum cleaner means for vacuuming a carpet, the vacuum cleaner means including support structure; roller means for rollably-supporting the support structure and mounted on the support structure; driven-swivel wheel means for supporting and propelling in diverse directions and mounted on said support structure; said roller means and said driven-swivel wheel means and the support structure in combination being adapted for moving the support structure randomly in alternate directions and intermittently changing direction whenever an obstacle is encountered; electrically-driven motor mounted on said support structure connected to drive said vacuum cleaner means and connected to drive said driven-swivel wheel means; battery means connected to supply power to said electrically-driven motor, said battery means including a rechargeable battery and motor-drive circuitry connected in circuit with the rechargeable battery such that power is providable to said electrically-driven motor, and said battery means additionally including a battery recharging circuitry means for recharging the rechargeable battery when connected to a source of out-

side electrical power, the battery recharging circuitry means including a rectifier and transformer interconnected with said rechargeable battery such that low voltage rectified direct electrical current is providable to the rechargeable battery in recharging circuitry; switching circuitry for switching to and from connecting said rechargeable battery means to said rectifier and transformer, and for connecting said battery means to said electrically-driven motor; and a timer means for setting activation time, period of running subsequent to an activation, and for deactivation of said switching circuitry for that portion of the switching circuitry for connecting and disconnecting the rechargeable battery to and from said electrically-driven motor.

4,173,810

TWIN-WHEEL CASTOR

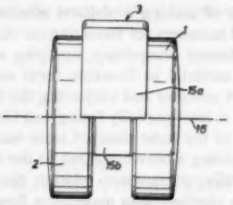
Michael J. James, Cheltenham, England, assignor to Global Castors and Hardware Limited, Cheltenham, England

Filed Jun. 9, 1978, Ser. No. 914,292

Claims priority, application United Kingdom, Mar. 13, 1978, 9785/78

Int. Cl.² B60B *33/00*

U.S. Cl. 16—47 **11 Claims**



1. A twin-wheel castor comprising a body and two coaxial wheels mounted respectively on opposite sides of the body with separate stub axles of the wheels rotatably engaging within the body, said axles having grooves which are engaged by internal projections of said body whereby to retain the axles in the body and provide snap-in assembly of the wheels to the body, said projections comprising for engagement with each axle groove at least one projection with the projections relatively arranged so that, in axial projection, there is no overlap of any one of the projections with another.

4,173,811

SKI-TIE DEVICE

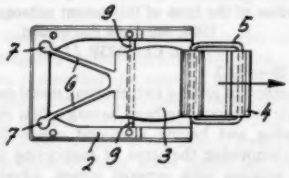
Theodor Kokeisl, Zurlindenstrasse 21, 5000 Aarau, Switzerland

Filed Dec. 28, 1977, Ser. No. 865,301

Claims priority, application Switzerland, Dec. 29, 1976, 16428/76

Int. Cl.² A44B *21/00*; A63C *11/02*

U.S. Cl. 24—73 SG **8 Claims**



1. A device for tying a pair of skis together, comprising:

a substantially flat housing adapted to be mounted on an upper surface of a ski and to extend transversely thereof, said housing defining a compartment having a window opening at one side of the housing;

an elongated elastic band having an inner end resiliently connected to said housing within said compartment at a location remote from said window and a free end provided with a grip engageable by a user to draw said band through said window, said free end being provided with means engageable with another such housing on another ski whereby said band holds a pair of skis together;

at least one elastic member anchored to said housing at said location and connected to said inner end of said band for resiliently connecting same to said housing; and

an abutment formed on said housing adjacent said window and engageable with a formation on said inner end of said band upon withdrawal of said band through said opening to anchor said inner end of said band within said housing, said inner end of said band being elastically drawn away from said abutment by said member in a relaxed condition of said band, said elastic member having a lesser force constant than the portion of said band between said ends.

4,173,812

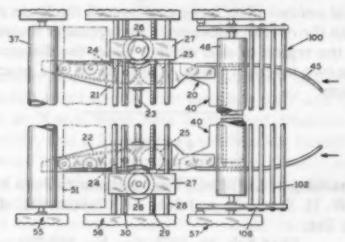
APPARATUS FOR CALENDERING TUBULAR KNITTED FABRICS

Andrew P. Cecere, Valley Stream, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,514

Int. Cl.² D06C *5/00*

U.S. Cl. 26—84 **13 Claims**



1. Apparatus for processing tubular knitted fabric, which comprises

(a) a pair of opposed processing rollers,

(b) means for driving said rollers at equal peripheral speeds,

(c) a generally flat spreader frame arranged to laterally distend tubular knitted fabric to flat, two-layer form and having a discharge end at the nip formed by said processing rollers,

(d) opposed edge drive rolls engaging and supporting said spreader frame by contact with opposed external side edge portions thereof, whereby tubular fabric may be advanced over said spreader frame by said edge drive rolls,

(e) first and second opposed contact rolls disposed respectively above and below the spreader frame on the upstream side of said edge drive rolls,

(f) flat contact plate means extending substantially the full width of said spreader frame and positioned in opposed relation to said contact rolls,

(g) said contact rolls and contact plate means being so related that a single layer of tubular knitted fabric, passing therebetween, is grippingly engaged across the full effective width of the contact plate means by a contact roll,

(h) first controllable drive means for driving said edge drive rolls, and

(i) second and third controllable drive means for driving said contact rolls at speeds variable with respect to each other and with respect to said edge drive rolls,

(j) said spreader, in the immediate region of said contact plate, being of a width to distend said fabric substantially to its full width,

(k) said contact plate having an overall thickness not greater than the overall thickness of said spreader frame whereby, in the region of said contact plate, the distance between

the two layers of fabric is maintained at a practical minimum.

9. Apparatus for processing tubular knitted fabric, which comprises

(a) a generally flat spreader frame arranged to receive tubular knitted fabric and to distend it to flat, two-layer form at a predetermined width,

(b) said spreader frame including spaced, opposed, width-adjustable side frame members,

(c) means for advancing tubular knitted fabric over said frame at a controllable rate,

(d) a thin, flat contact plate extending between said side frame members,

(e) a pair of transversely disposed contact rolls positioned above and below said contact plate and extending for at least the full width of said spreader frame,

(f) said contact rolls being adjustable with respect to said contact plate whereby a layer of fabric passing between the plate and a contact roll is grippingly engaged by said roll over substantially the full width of the plate, and

(g) means for controllably rotating said contact rolls at speeds variable with respect to each other and with respect to the advancing means,

(h) said spreader, in the immediate region of said contact plate, being of a width to distend said fabric substantially to its full width,

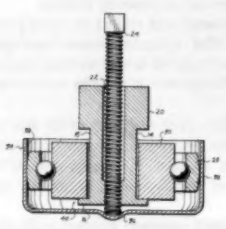
(i) said contact plate having an overall thickness not greater than the overall thickness of said spreader frame whereby, in the region of said contact plate, the distance between the two layers of fabric is maintained at a practical minimum.

4,173,813

BEARING PULLER

John Stockinger, Littlefield, Tex., assignor to John M. Clayton, Jr.; W. H. Berry, Jr. and John M. Clayton, III, all of Littlefield, Tex.

Filed Feb. 24, 1978, Ser. No. 880,784
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—266 **6 Claims**



1. In combination, a bearing and a bearing puller for removing the bearing;

a. the bearing within

b. a cup having

(i) a closed bottom, and

(ii) cylindrical sides,

c. said bearing having

(i) an outer race pressed into the cylindrical sides of the cup, and

(ii) an inner race in the outer race with

(iii) a non-circular hole in the inner race, and there being

d. a space between the inner race and the closed bottom; the bearing puller including:

e. an integral spool having a bottom and top end,

f. a flange on the bottom end of the spool,

(i) said flange in the space between the inner race and the closed bottom,

(ii) said flange of correlative cross-section as the hole in the inner race and smaller than the hole, and

(iii) said flange having a thickness less than the space between the inner race and closed bottom,

g. a neck on the spool of lesser cross-section than the flange and extending through the inner race,

h. wrench flats on the top end of the spool above the bearing,

j. a threaded axial bore through the spool, and

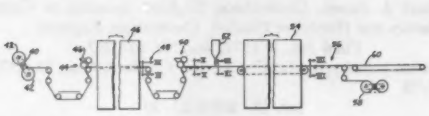
k. a screw threaded through the spool.

4,173,814

PAD MEMBER METHOD OF MANUFACTURE

James H. Enicks, Meadownbrook La., Box 247, Blawenburg, N.J. 08504

Filed Jul. 7, 1977, Ser. No. 813,447
Int. Cl.[2] B29D *27/04*
U.S. Cl. 29—417 **24 Claims**



1. A method of making a resilient member for use in the forming of pad members for mounting on the body in protective relation thereto comprising; applying a first layer of a plastisol resin material in flowable form onto an elongated moving support member and subjecting the first layer to heat for gelling and at least partially fusing said first layer, applying a second layer of the same plastisol resin material in flowable form but containing a blowing agent to the first layer in substantially laterally coextensive relation thereto, applying a third layer of a plastisol resin material in flowable form in the form of a ribbon over at least one selected lateral region of said second layer and of a lateral extent less than that of the second layer, subjecting the superposed layers to further heat fuse and foam the layers of plastisol resin materials while integrally bonding the layers thereof together, and stripping the bonded, fused and foamed material from said support member.

5. The method according to claim 1 which includes stamping out contoured pad members from said fused and foamed material.

15. The method according to claim 5 which includes connecting elastic strap means to said pad member for mounting of the pad member on the body.

4,173,815

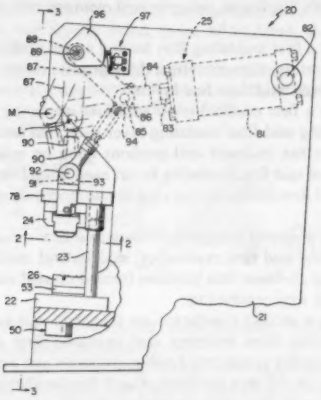
METHOD OF JOINING TWO ABUTTING METAL MEMBERS TOGETHER

Joseph W. Lux, and John M. Varanelli, both of Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 707,780, Jul. 22, 1976, Pat. No. 4,035,901.
This application Apr. 27, 1977, Ser. No. 791,322
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432.1 **2 Claims**

1. A method of joining two abutting metal members together by a single reciprocating head having a first means for lancing and forming and having a second means for staking, said method comprising the steps of supporting said members in abutting relation with support means, advancing said head toward said supported members to cause said first means to lance and form a part of one of said members through an unblanked part of the other of said members while said members are supported by said support means in opposition to the advancing movement of said head, thereafter withdrawing said head from said members, and then advancing said head a second time toward said supported members to cause said second means to stake the lanced and formed part of said one member

to said other member and thereby secure said members together while said members are supported by said support



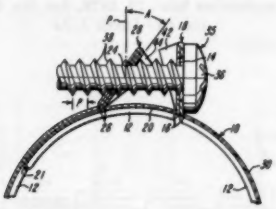
means in opposition to the second advancing movement of said head.

4,173,816

METHOD OF MAKING A HOSE CLAMP WITH TANGENTIAL SCREW

Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409, and James F. Pease, 5805 Folkestone Dr., Dayton, Ohio 45459

Division of Ser. No. 703,760, Jul. 9, 1976, Pat. No. 4,078,281, which is a continuation-in-part of Ser. No. 565,545, Apr. 7, 1975, abandoned. This application Mar. 13, 1978, Ser. No. 885,675
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—526 R **8 Claims**



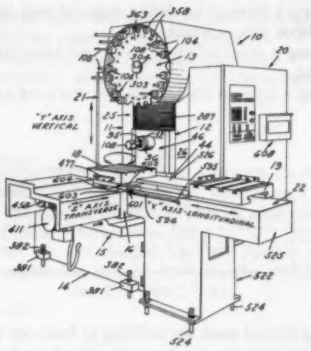
1. A method of making a hose clamp having a part-cylindrical band portion integrally connecting a first ear portion and a second ear portion, comprising the steps of folding one end portion of an elongated metal strip to form a folded metal first ear portion with an integral tongue portion projecting therefrom, folding a second end portion of the strip to form a folded metal second ear portion, forming holes within the first and second ear portions, bending the strip to form the part-cylindrical band portion, extending a screw through the holes within the ear portions with the screw threads engaging the second ear portion, and cocking the second ear portion at a substantial angle relative to a reference plane perpendicular to the axis of the screw and in converging relation with the first ear portion for producing a positive non-stripping engagement of the second ear portion with the screw threads.

4,173,817

MACHINING CENTER WITH AUTOMATIC TOOL CHANGER

Leonhard Voglrieder, Howell, and Raymond O. Hempel, Jr., LaSalle, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Division of Ser. No. 790,224, Apr. 25, 1977, Pat. No. 4,102,035.
This application Mar. 9, 1978, Ser. No. 885,045
Int. Cl.[2] B23Q *3/157, 1/06*
U.S. Cl. 29—568 **7 Claims**



1. In a machine tool having a column assembly on which is slidably mounted a tool spindle slide assembly on Y-axis ways, and wherein an X-axis ways base is mounted adjacent said column assembly, and a Z-axis ways saddle slide assembly is slidably mounted on the X-axis ways, and a work table assembly is slidably mounted on the Z-axis ways on the saddle slide assembly, the combination of:

(a) a pallet base member rotatably mounted on said work table assembly;

(b) a pallet slidably mounted on said pallet base member;

(c) a clamp plate movably mounted on said pallet base member for clamping the pallet on said base member;

(d) power drive means for rotating said pallet base member;

(e) said pallet being provided with means for sliding the pallet off said pallet base member; and

(f) means for moving said clamp plate between a clamped operative position, and an unclamped inoperative position wherein said means for moving said clamp plate includes:

(1) spring means for moving said clamp plate downwardly to a clamped operative position; and

(2) cam means for moving said clamp plate to said unclamped inoperative position.

4,173,818

METHOD FOR FABRICATING TRANSISTOR STRUCTURES HAVING VERY SHORT EFFECTIVE CHANNELS

Ernest Bassous, Riverdale; Tak H. Ning, Yorktown Heights, and Carlton M. Osburn, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1978, Ser. No. 910,254
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **10 Claims**

1. A method for fabricating a transistor structure having a short channel length including controlled high voltage threshold and low voltage threshold regions comprising the steps of:

A. forming a first mask having first and second opposed edges over a first area of a body of semiconductor material of one conductivity type,

B. ion implanting impurities into said semiconductor material at said edges of said first mask to form field regions,

C. growing thermal oxide in said semiconductor material at said edges of said first mask to form field oxide regions,

D. removing said first mask and ion implanting impurities of opposite conductivity type into said semiconductor material between said field oxide regions to form a channel region,

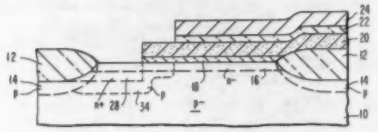
E. forming a layer of gate oxide over said implanted channel region,

F. forming and doping a layer of polysilicon over said layer of gate oxide to form doped polysilicon gate material of opposite conductivity type,

G. forming a layer of insulating material over said layer of polysilicon gate material,

H. forming a layer of metal over said layer of insulating material,

I. forming a layer of photoresist material over said layer of metal,



J. using a second mask for defining at least one of a source and drain region and at least one side of a polysilicon gate region, exposing and etching said photoresist, metal, insulating material and polysilicon material to open said at least one of said source and drain regions and to form at least one side of a polysilicon gate,

K. ion implanting impurities through said at least one open source and drain regions to form at least one of said transistor source and drain in said body of semiconductor material, said at least one of said source and drain being aligned with said at least one side of said polysilicon gate,

L. laterally etching away a predetermined amount of at least one side of said remaining metal layer over at least one side of said channel region,

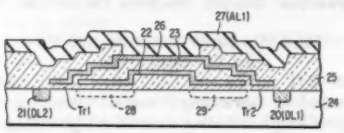
M. and, using said remaining metal layer as a third mask, ion implanting a controlled amount of impurities into one side of said channel region to adjust the threshold voltage of the high threshold voltage channel region for said transistor structure.

4,173,819

METHOD OF MANUFACTURING A DYNAMIC RANDOM ACCESS MEMORY USING MOS FETS

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 764,897, Feb. 2, 1977, Pat. No. 4,131,906. This application Aug. 4, 1978, Ser. No. 931,246
Claims priority, application Japan, Feb. 13, 1976, 51/14568
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **3 Claims**



1. A method for manufacturing a dynamic random access memory using a plurality of MOS FETS, wherein the MOS FETS are formed on a semiconductor substrate having a first conductivity type, comprising:

diffusing at least one pair of data line layers having a second conductivity type opposite to said first conductivity type into said substrate;

forming a pair of co-linear adjacent memory cells between the data line layers, wherein said memory cells are formed by,

forming a first insulating film having a pair of thin co-linear end portions separated by a thick portion on said substrate betweeen said data line layers,

forming a first conductor on said first insulating layer and bridging said first insulating layer such that said first conductor has co-linear end portions lying on said thin portions of said first insulating layer, each of said end portions of said first conductor serving as one electrode of a capacitor,

forming a second insulating film on said first conductor and bridging said first conductor, said second insulating film having co-linear thin portions formed on said end portions of said first conductor;

forming a second conductor on said first and said second insulating films bridging said insulated first conductor, said second conductor having co-linear end portions disposed on the thin portions of said first insulating film and serving as the gate electrodes of said pair of adjacent memory cells, said second conductor having a central portion bridging said first conductor and insulated therefrom by said second insulating film,

forming an address line above said memory cells,

locating a single contact hole in said address line to said central portion of said second conductor between the co-linear adjacent memory cells, and

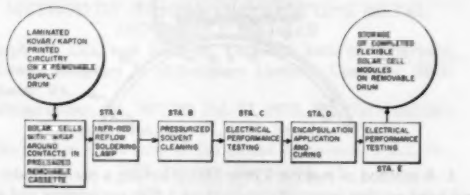
connecting said address line to said central portion of said second electrode through said contact hole.

4,173,820

METHOD FOR FORMING A SOLAR ARRAY STRIP

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert L. Mueller, Azusa, and Robert K. Yasui, Torrance, both of Calif.

Division of Ser. No. 809,890, Jun. 24, 1977, Pat. No. 4,133,697. This application Mar. 29, 1978, Ser. No. 891,358
Int. Cl.[2] H05K *3/34*
U.S. Cl. 29—572 **7 Claims**


LAMINATED KOVAR / KAPTON PRINTED CIRCUITRY ON K REMOVABLE SUPPLY DRUM
STORAGE OF COMPLETED FLEXIBLE SOLAR CELL MODULES ON REMOVABLE DRUM
SOLAR CELLS WITH WRAP AROUND CONTACTS IN PRELOADED REMOVABLE CASSETTE
STA. A
INFR-RED REFLOW SOLDERING LAMP
STA. B
PRESSURIZED SOLVENT CLEANING
STA. C
ELECTRICAL PERFORMANCE TESTING
STA. D
ENCAPSULATION APPLICATION AND CURING
ELECTRICAL PERFORMANCE TESTING
STA. E

1. In a method for forming a flexible solar array strip, the steps comprising:

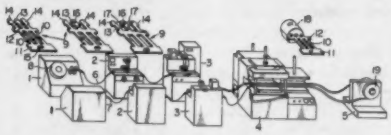
A. feeding along a linear path a flexible substrate comprising a pair of laminated layers of polyamide having printed circuitry deposited therebetween, at least one layer of said pair of layers having defined therein apertures within which solder pads are deposited in engagement with the printed circuitry; and

B. individually transporting solar cells into engagement with the solder pads and subjecting the solder pads engaged by each solar cell to infrared radiation for a period sufficient for causing the solder to flow.

4,173,821
METHOD OF PRODUCING SEMICONDUCTOR DEVICES

Masatoshi Yamamoto, Higashimurayama; Keisuke Makino, Funabashi; Kiyomi Suzukawa, Zushi; Souichirou Nakamura, Takasaki, and Kiyomi Sakai, Sawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 23, 1977, Ser. No. 827,091
Claims priority, application Japan, Aug. 25, 1976, 51-100637
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—574 **13 Claims**



8. A method of fabricating semiconductor devices, said method comprising the steps of:

preparing a lead frame strip formed of a series of the same repeated lead frame unit each having plural lead members;

mounting a semiconductor element to at least one of said lead members of each of said lead frame units;

molding each said semiconductor element with resin;

winding said lead frame strip on a reel after said molding step;

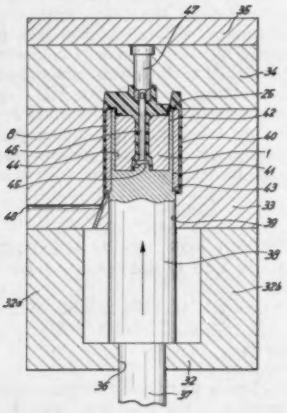
baking the resin-molded wound-up lead frame strip; and

performing succeeding steps for producing the semiconductor devices in an unwound condition of said lead frame strip.

4,173,822
METHOD FOR ASSEMBLING A STATOR FOR AN ELECTRIC MACHINE

Bodo Fütterer, Lucerne; Jürgen Mayer, and Hugo Fritschy, both of Sachseln, all of Switzerland, assignors to Interelectric Aktiengesellschaft, Sachseln, Switzerland

Division of Ser. No. 594,768, Jul. 10, 1975. This application Dec. 30, 1977, Ser. No. 865,979
Int. Cl.[2] H02K *15/02*
U.S. Cl. 29—596 **4 Claims**



1. A method of assembling a stator for an electric machine of the type having a bell-shaped rotor, a permanent magnet, a face plate holding said permanent magnet, a flux return ring abutting said face plate with one of its end faces and concentrically surrounding said permanent magnet, a casing intimately surrounding the outer surface of said flux return ring, comprising the steps of:

(a) sliding the permanent magnet into the interior of a support die, a plunger fitting into said die having an inner wall defining a cylindrical portion, the diameter of which corresponds to the inner diameter of the air gap space of said machine;

(b) sliding a flux return ring over the outer wall of said plunger;

(c) placing over the assembly, so obtained, a casting mold having a cavity conforming to the configuration of said stator;

(d) closing said mold and injecting plastic material thereinto;

(e) allowing the plastic material to harden;

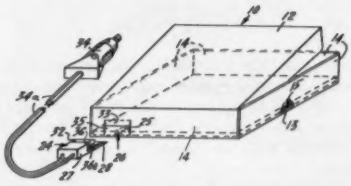
(f) retracting the plunger from said die; and

(g) disassembling said die mold and removing the stator therefrom.

4,173,823
RESISTANCE HEATER FOR A PIZZA CARTON

Thomas L. Anderson, Neenah; Glenn A. Rasmussen, Larsen, and Gerald J. Van Handel, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 816,444, Jul. 18, 1977, Pat. No. 4,134,004. This application Jun. 23, 1978, Ser. No. 918,690
Int. Cl.[2] H01C *7/00*
U.S. Cl. 29—611 **4 Claims**



1. In the fabrication of electrical resistance heater means, the method comprising: forming a sheet of electrically resistive material; laying down a strip of electrically conductive material on said sheet of electrically resistive material, in such a pattern that said strip has mutually spaced substantially parallel portions and an interconnecting portion; and converting said parallel strip portions into electrode means for said electrically resistive material and said interconnecting strip portions into terminal means for said electrode means by severing said interconnecting portion and said resistive material underlying same, and severing said resistive material along a region adjacent said interconnecting strip portion and to the side thereof disposed between said parallel strip portions.

4,173,824
APPARATUS FOR AUTOMATICALLY ASSEMBLING ARTICLES, SUCH AS CLIPS

Maurice Wolfthal, Ossining, N.Y., assignor to Stewart Stamping Corporation, Yonkers, N.Y.

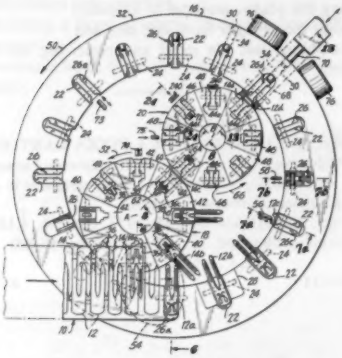
Filed Nov. 14, 1977, Ser. No. 851,516
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—783 **22 Claims**

1. Apparatus for automatically manufacturing articles including first and second components, such as clips, comprising:

a rotatably mounted first annular or dial member having an upper edge surface, an outer edge surface and an inner edge surface defining an inner area, and a plurality of first component clamping assemblies mounted thereon and spaced therearound, said first annular or dial member sequentially receiving at a receiving station and releasably holding a plurality of first components and sequentially indexing each of said first components to an assembly station;

a second dial member having outer and upper edge surfaces, said second dial member being rotatably mounted within said inner area and having a plurality of second component clamping assemblies mounted thereon and spaced therearound, said second dial member sequentially receiving at said receiving station and releasably holding a plurality of second components and sequentially indexing each of said second components to a transfer station;

a third dial member having outer and upper edge surfaces, said third dial member being rotatably mounted within said inner area and having a plurality of second component clamping assemblies mounted thereon and spaced



therearound, said third dial member sequentially receiving said plurality of second components at said transfer station and releasably holding and sequentially indexing said second components to said assembly station into confronting relationship with corresponding ones of said first components;

means for sequentially transferring said second components from said second dial member clamping assemblies to said third dial member clamping assemblies; and

means located at said assembly station for sequentially assembling each pair of confronting first and second components to each other to form said article.

4,173,825

NUTCRACKER

William A. Papalardo, P.O. Box 273, Centerport, N.Y. 11721

Division of Ser. No. 844,211, Oct. 21, 1977. This application Dec. 15, 1978, Ser. No. 969,805

Int. Cl.[2] B26B *17/00*

U.S. Cl. 30—120.3 **10 Claims**

1. A cracking device, comprising in combination:

a first elongate rigid member having a generally concave surface for engaging the object to be cracked, and an elongate handle portion;

a second elongate rigid member having second and third generally concave surfaces for engaging the object to be cracked, and an elongate handle portion; and

a rigid coupling member linking together said first and second elongate members adjacent their respective nut supporting surfaces, said first elongate member being pivotally connected to said coupling member so as to permit relative movement toward and away from said second elongate member, and said second elongate member being rotatably connected to said coupling member so as to permit relative pivotal movement between said second elongate member and said coupling member so that said second elongate member may be rotated relative to said first elongate member between a first position in which said first and second generally concave surfaces face one another, and a second position in which said first and third generally concave surfaces face one another.

4,173,826

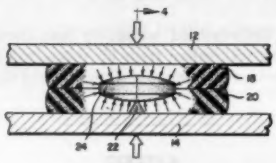
APPARATUS FOR CUTTING PILLS

Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613, and William P. Heinrich, 2709 W. Sterling Dr., McHenry, Ill. 60050

Filed Aug. 17, 1978, Ser. No. 934,336

Int. Cl.[2] B26B *11/00*

U.S. Cl. 30—124 **2 Claims**



1. A pill cutter comprising an upper member and a lower member which are affixed together at one end thereof, a resilient pad affixed to each of said upper and lower members and disposed so as to compressingly engage one another when said upper and lower members are pressed together, one of said resilient pads being of continuous area covering a continuous area of one of said members, the second pad covering a similar area of the other member but comprising a split construction slightly spaced apart, a cutting element disposed between the split apart portions of said second split resilient pad, a pill to be cut placed upon one of said resilient pads, said upper and lower members pressed together to initially contain said pill compressed between said resilient pads, and said cutting element engaging and splitting said pill upon said upper and lower members being pressed together sufficiently to compress said resilient pads and bring said pill into engagement with said cutting element, at least one of said resilient pads comprising a recessed pocket for receiving therein a pill to be cut.

4,173,827

CONTROL FOR DENTAL HANDPIECES

George K. Austin, Jr., P.O. Box 209, Rte. 2, Box 254, Newberg, Oreg. 97132

Filed Feb. 11, 1976, Ser. No. 657,146

Int. Cl.[2] A61C *19/02*

U.S. Cl. 433—98 **11 Claims**

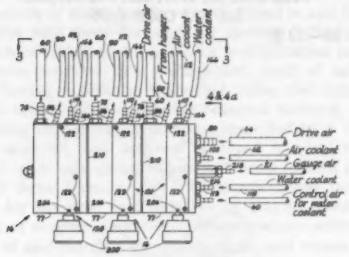
1. In a dental control,

a thin block having transverse main passages extending from one side edge to the other side edge, branch passages leadng from the main passages to one face of the block, and outlet passages leading from said one face to an end edge of the block,

a diaphragm sheet on said one face of the block and adapted to close the ends of the branch passages when pressed against said one face of the block,

and a thin cover on the diaphragm sheet and secured to the block,

the cover having diaphragm chambers therein opposite the ends of the branch and outlet passages and also having control fluid passages to the diaphragm chambers for pressing the corresponding portions of the diaphragm sheet against said one face of the block,



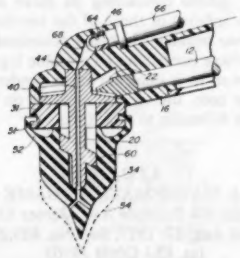
some of the diaphragm chambers being circular and some of the diaphragm chambers including long runners extending from one of the circular chambers to another of the circular chambers and adapted to be closed when the corresponding portions of the diaphragm sheet are pressed against said one face of the block.

4,173,828

INTERCHANGEABLE TOOL OPERATING APPARATUS WITH PLURAL MOTION

Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159, and Leonard L. Krasnow, Westboro, Mass., assignors to Leopold Paul Lustig, Newton Centre, Mass.

Filed Dec. 19, 1977, Ser. No. 861,643
Int. Cl.[2] A61C *3/06, 1/10;* **E02D** *7/02;* **B26B** *1/00*
U.S. Cl. 433—87 **34 Claims**



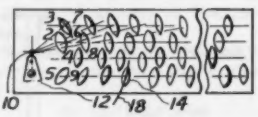
1. A tool operating apparatus for driving alternatively at least a first tool and a second tools from a single tool driving means to which each of said tools can be removably coupled, in which the tool driving means comprises a rotatable shaft and a support in which the shaft is journaled for rotation around its longitudinal axis, and tool engagement means fixed to the shaft, the first tool having a first aperture for receiving the shaft and means in the first aperture to engage the tool engagement means for rotating the first tool with the shaft, the second tool having a second aperture for receiving the shaft and the tool engagement means, and means on the second tool to engage the support so as to hold the second tool non-rotatably fixed to said support, the shaft and the tool engagement means being free to rotate relative to the second tool within the second aperture, and means in the second aperture for coupling with the tool engagement means to drive the second tool in an oscillatory path relative to said axis during rotation of the shaft in the second aperture.

4,173,829

DRAFTING INSTRUMENT

George Khait, 516-28th Ave. #3, San Francisco, Calif. 94121

Filed Apr. 25, 1978, Ser. No. 899,943
Int. Cl.[2] B43L *9/04*
U.S. Cl. 33—27 C **16 Claims**



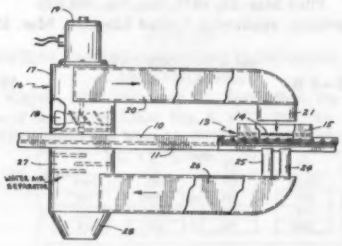
14. A circle drafting template comprising a flat sheet of a solid material having pivot means for enabling said template to be rotated about said pivot means in a single plane on a flat surface, a plurality of rows of holes in said template, each of said holes having an exclusive spacing from said pivot means so as to enable a plurality of circles of different radii to be drawn by placing a writing instrument in said holes and rotating said template therewith, adjacent rows of holes being sufficiently closely spaced and the holes in adjacent rows being positioned with staggered spacings such that the holes in adjacent rows overlap when viewed from a location between the ends of said rows, each of said holes being shaped to have confronting edges on opposite sides of a circumference line of a circle, the center of which is at said pivot means, said confronting edges being most widely spaced along one radius from said pivot means and converging therefrom to join and form an acute angle on said circumference line, corresponding points of said confronting edges along any radius through said hole being equidistantly spaced from said circumference line.

4,173,830

DRYER FOR MESH BASKETS

Douglas R. Hanson, 1720-9th Ave. South, Anoka, Minn. 55303

Filed Dec. 12, 1977, Ser. No. 859,276
Int. Cl.[2] F26B *5/04*
U.S. Cl. 34—15 **6 Claims**

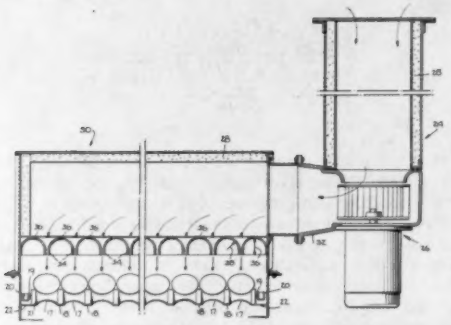


6. A method of removing water from and drying perforated bottom articles carried on a conveyor using a recirculating fan member having a pressure side and a vacuum side, said fan generating a desired volume of air, comprising the steps of directing air from said pressure side of the fan in a high velocity stream directly through the perforated bottom of the article as it is moved on said conveyor to force the airstream to pass through the perforated bottom of said article and to carry water on the article through said article, collecting the water laden air that has passed through said article and returning said water laden air to the vacuum side of said fan, and separating at least portions of the water carried by the air to the vacuum side of the fan out of the airstream prior to recirculation of the air by said fan.

4,173,831
EGG DRYING APPARATUS

Robert C. McCord, Romulus, Mich., assignor to Diamond International Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,138
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—236 11 Claims

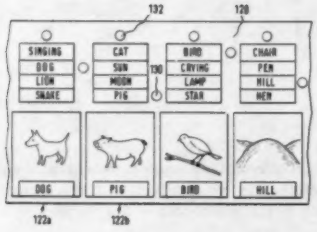


1. An egg drying apparatus comprising conveyor means for advancing eggs through said apparatus, air displacement means for moving air towards said eggs being conveyed through said apparatus, a chamber in communication with said air displacement means, air directing means disposed in said chamber and in communication with said air displacement means for directing air towards eggs being advanced through said apparatus, said air directing means including a plurality of elongated orifices disposed in the bottom of said chamber, said orifices being positioned above said conveyor means to discharge air towards eggs being advanced by the conveyor means, each of the orifices having a coefficient of discharge of at least about 0.8.

4,173,832
EDUCATIONAL TOY

Lim B. Chen, and Lim L. Cher, both of Sunway Garden, F2 17th Floor, 989 King's Rd., Hong Kong, Hong Kong

Filed Mar. 15, 1978, Ser. No. 886,633
Claims priority, application United Kingdom, Mar. 25, 1977, 12593/77
Int. Cl.[2] G09B *7/06*
U.S. Cl. 35—9 B 18 Claims

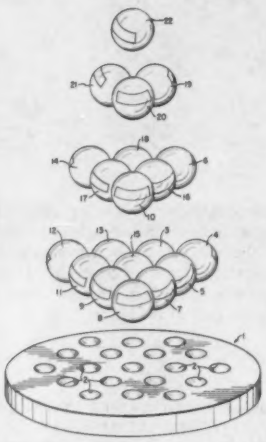


1. An educational toy which comprises a first set of windows and a second set of windows, a first set of keys selectively operable to cause one of a plurality of first images to be displayed in the respective one of the windows in the first set and to cause a simultaneous display of an associated one of a plurality of second images in the second set of windows for a predetermined length of time, a second set of keys, each having as a label a respective one of said second images and selectively operable at the end of the said predetermined length of time, and means for indicating correspondence and non-correspondence between the label of the selected key of the second set and the image displayed in the window of the said first set.

4,173,833
PSYCHOLOGICAL GAME

Martin Rosenblatt, 23909 Berdon St., Woodland Hills, Calif. 91367

Filed Dec. 22, 1977, Ser. No. 863,211
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—22 R 2 Claims

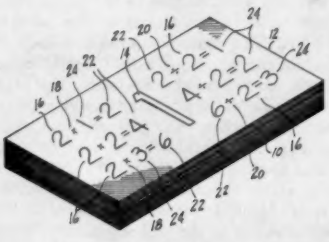


1. A psychological game apparatus for enhancing personal exploration and growth, comprising a flat base having at least ten recesses for receiving respective spheres in a contiguous relationship, and at least four tetrahedrons, each comprising four spheres of a selected color mounted in said recesses, each said tetrahedron comprising a base layer of three spheres and an apex of one sphere contacting its three associated base spheres, the base spheres of three of the tetrahedrons and the apex sphere of one tetrahedron being contained in said recesses, with each sphere containing an erasable legend written by the user in answer to a question on a predetermined topic pertaining to the user, the written legends on the spheres of each tetrahedron referring to one topic.

4,173,834
EDUCATIONAL MATHEMATICAL GAME APPARATUS

Alberto H. Arzola, 308 Palisade Ave., Jersey City, N.J. 07307

Filed Aug. 17, 1977, Ser. No. 825,232
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 R 1 Claim



1. A plurality of playing cards, one lateral surface of each of said cards bearing indicia, including three formulas for numeral multiplication, said indicia including three formulas for numeral division, each of said formulas for numeral multiplica-

tion and each of said formulas for numeral division utilizing one common number as a multiplicand and as a divisor respectively, said one common number ranging from two to twelve, each of said formulas for multiplication and each of said formulas for division including an equal sign, each of said formulas for multiplication including a numeral representing the product of multiplication, each of said three formulas for division including individually one of said numerals representing said three products of multiplication as a dividend in said formulas for division, said three formulas for division including quotients, each of said three formulas for multiplication including one of three numbers as a multiplicand, each of said three numbers having a different numerical value, and equaling in numerical value said quotients, an enlarged numeral, each of said plurality of playing cards being identified by a different enlarged numeral, said different enlarged numeral being in sequential order, said enlarged numeral being located intermediate said three formulas for multiplication and said three formulas for division, said plurality of playing cards being forty-four in number, means to evaluate a score achieved by the users of said plurality of playing cards, said means including four wheels, said four wheels each being pivotably secured to a plate, said plate having four openings therein, said openings being disposed juxtaposed with the location of each of said four wheels, each of said four wheels suitably identified by an individual color, each of said four wheels carrying numerical indicia thereon, whereby said numerical indicia carried by said each of said four wheels may be viewed through said four openings, four individually colored and individually decorated medallions, each of said medallions having an equivalent color to said identifying color of said four wheels, a time clock, said clock for timing the completion of the use of said cards by said users, said clock including a manual start button and a manual stop button for operating a pointer of said clock.

4,173,835

SNOW REMOVAL TOOL

Dean W. Burrell, 35 Jefferson St., Ellicottville, N.Y. 14731

Filed Oct. 31, 1977, Ser. No. 847,409

Int. Cl.[2] E01H *5/02*

U.S. Cl. 37—53 **6 Claims**

1. A hand tool for manually shifting flake or granular material comprising:

a. a longitudinally extending handle;

b. a laterally extending base member fixed to one end of said handle;

c. a laterally extending plate member oriented to face in the direction of said longitudinally extending handle; and

d. a plurality of resiliently deflectable, laterally spaced, longitudinally extending flat-sided strips oriented to face in a direction generally normal to both said handle and said base member and attached to said base member at their first ends and to said plate member at their extreme second ends so as to extend away from the end of but generally parallel to the length of said handle, a first multiplicity of said strips lying in a first plane and a second multiplicity of said strips lying in a second plane, said first and second planes intersecting said plate in first a second laterally spaced paralleled lines respectively, whereby said flat side of said strips provided partial obstruction to the flow of said flake or granular material from one side of said tool to the other when said tool is moved in a sweeping motion in the direction in which said flat sides face.

4,173,836

CONDITION RESPONSIVE TRENCH EXCAVATOR

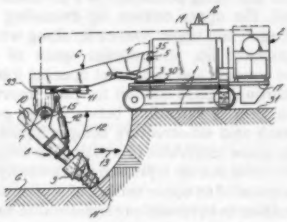
Friedrich W. Paurat, Nordstrasse 73, D-4223 Voerde 2, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,733

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700950

Int. Cl.[2] E02F *5/04*

U.S. Cl. 37—81 **7 Claims**



1. A trench-excavating machine comprising, in combination:

a chassis having tracks for propelling the chassis along the ground and a drive connected to said tracks;

a turntable mounted on said chassis and swingable about a vertical axis;

a boom mounted on said turntable for swinging movement about a horizontal axis thereon;

a cutting head swingable on the free end of said boom about a horizontal axis, said cutting head being formed with a cutting tool rotatable about an axis substantially perpendicular to the swinging axis of said cutting head; and

control means responsive to the inclination of said axis of said tool relative to the ground and controlling said drive for varying the drive force in dependence upon the inclination of said head.

4,173,837

MICROFILM JACKET MICROFILM FEEDING DEVICE AND PROCESS

Paul A. Kiejzik, 2907 Monterey Ct., Springfield, Pa. 19069

Division of Ser. No. 611,004, Sep. 8, 1975, Pat. No. 4,003,187. This application May 13, 1976, Ser. No. 845,483

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—159 **3 Claims**

1. A microfilm jacket having upper and lower elongated sheets extending between proximal and distal ends thereof with fused opposing faces positioned one above the other and the fused opposing faces being in contact and fused to one-another at spaced-apart lines, said lines defining a storage through-space conduit along a longitudinal axis of the upper and lower

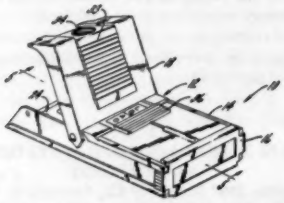
elongated sheets, and the storage through-space conduit having an outlet opening between said upper and lower elongated sheets at said distal end, said upper elongated sheet having a plurality of insert openings in series, and said plurality and said outlet opening being in common communication with through-space of said storage throughspace conduit; and said upper elongated sheet including slit-structures each forming one of said insert openings as a normally-closed arced slit extending up to one of said spaced-apart lines at each of opposite ends of the normally-closed arced slit, each normally-closed arc slit extending transversely to said longitudinal axis; and for each of said plurality, said slit structure consisting of a first section of the upper elongated sheet having a lower concave lip and in opposing relationship thereto on upper convex lip of a second section of the upper elongated sheet, at least one of the normally-closed arced slits being positioned in a direction toward said proximate end, the upper convex lip extending toward the proximal end; each said upper convex lip along with its respective lower concave lip, and storage space of the storage through-space conduit, and said outlet opening jointly forming said storage through-space conduit for each insert opening of said series; said series extending between said proximal and distal ends; each said slit-structure being adapted to form an insertion open space receivable of a microfilm strip lengthwise when the lower concave lip is pressed downwardly sufficiently for said first section of an upper surface of said upper elongated sheet in a direction toward said proximal end to form an angle with said second section of an upper surface of said upper elongated sheet in a direction from the upper convex lip toward said distal end; whereby microfilm strip is optionally insertable through alternate ones of said insert openings.

4,173,838

COMPACT REPEATING SLIDE VIEWER

Joseph Antos, Rte. 1, Box 33, Big Rock, Ill. 60511

Filed Apr. 28, 1978, Ser. No. 901,214
Int. Cl.[2] G02B *27/02*
U.S. Cl. 40—366 **8 Claims**



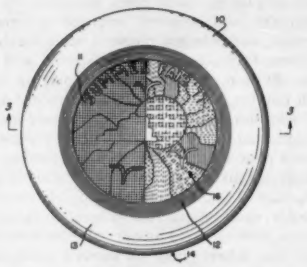
1. In a compact slide viewer, the combination comprising, a body portion having bottom and side walls, a slide carriage member longitudinally shiftable from one end of said body, said end of the body receiving the slide carriage defining a slide storage compartment and the opposite end of the body defining a slide viewing compartment having a translucent window therein, viewer lid means carrying a magnifying lens pivotally mounted to said body above the viewing compartment, a spring actuated tongue means disposed in said storage compartment, said slide carriage having an upper wall member defining a feeding edge, a shiftable member extending forwardly over said edge to retain slides in the storage compartment, a lower wall portion on said slide carriage including forwardly extending spaced fingers having upwardly extending hooks at their ends, at least one of said fingers having an inwardly directed tang, said tang causing the tongue to be retracted when the slide carriage is moved to its outwardly extended position and releasing the tongue upon reaching the substantially fully outwardly extended position of the slide carriage so that the stack is elevated to engage the uppermost slide with said feeding edge of the carriage whereupon inward movement of the carriage feeds the uppermost slide into the viewing compartment and outward movement of the carriage returns the viewed slide from the viewing compartment to the underside of the stack of slides in the storage compartment with said tongue being released from the stack while the viewed slide is being returned to the bottom of the stack.

4,173,839

AERODYNAMIC TOY

M. Jane Kovac, 1679 Elbur Ave., Lakewood, Ohio 44107

Filed Dec. 19, 1977, Ser. No. 861,647
Int. Cl.[2] A63H *33/18*
U.S. Cl. 46—74 D **9 Claims**



1. A flight-stable, aerodynamic toy, comprising:
a body element having an annular center section;
a flexible fabric material fixed in said center section;
a rim bounding said center section;
a convex wall bounding said rim;
said rim being tangential to said convex wall; and
means joined to said wall and cooperative therewith to define a reentrant-type cavity, having a greater transverse dimension therewithin than at the entry of said cavity, to cause said cavity to retain flight-sustaining air therewithin; wherein
said convex wall defines a convex surface which is smooth and devoid of any air-flow-disturbing protuberances and discontinuities;
said wall has a given thickness; and
said rim has a thickness greater than said given thickness, to rigidize and to lend hoop strength to said center section.

4,173,840

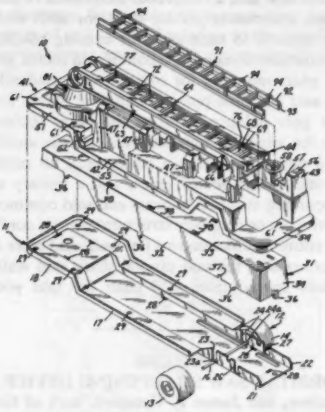
TURRET TOY VEHICLE

Curtis H. Fahrendorf, Anoka, and Delmar D. Berckhan, Wayzata, both of Minn., assignors to Tonka Corporation, Spring Park, Minn.

Filed May 31, 1977, Ser. No. 801,750
Int. Cl.[2] A63H *17/08*
U.S. Cl. 46—202 **16 Claims**

1. A toy fire engine comprising a body, wheel and axle assembly, aerial ladder and turret means, said turret means comprising:
a first turret member including a frustoconical side wall and a substantially flat upper wall, said side wall being intermediate said body and said upper wall, said side wall being integral with both said body and said upper wall, said side wall and said upper wall defining a cavity;
a second member including a frustoconical portion and an integral upwardly extending ladder support, said frustoconical portion being disposed within the cavity defined by said first member for rotational movement therein, said ladder support extending through said opening in said upper wall;
locking means for securing said second member within said

first member and for securing said aerial ladder to said ladder support;



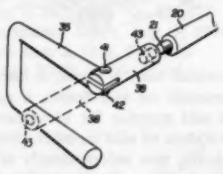
whereby said second member may be rotated within said first member thereby pivoting said aerial ladder about a central axis.

4,173,841

TOY HOOP GUIDE ROD

Richard K. Hensley, P.O. Box 151, Hazel Park, Mich. 48030

Filed Mar. 13, 1978, Ser. No. 885,508
Int. Cl.[2] A63H *33/02*
U.S. Cl. 46—220 **2 Claims**



1. A guide rod for rolling and guiding a toy hoop, comprising:

a U-shaped guide member formed of a base with integral legs;

the end of one of said legs being formed with an axially extending tongue portion having a transverse opening formed therethrough;

a short shaft having a slot for receiving said tongue and an opening arranged transversely of the slot;

said shaft being mounted upon said guide member by engaging said tongue within said slot and securing same therein by means of a mechanical fastener extending through said openings;

said shaft being adapted to be arranged to extend perpendicular to the plane of said guide member in either one or an opposite direction for either right hand or left hand use;

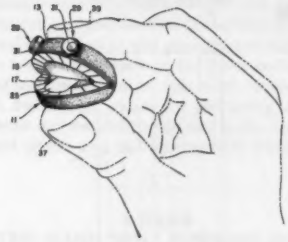
the opposite end of said shaft having a coupling means formed thereon and an elongated handle member provided with a corresponding coupling means for interengaging with said shaft to thereby provide the completed guide rod.

4,173,842

FINGER PUPPET

Rodney D. Bahner, 2835 Will Rogers Pl., Anchorage, Ak. 99503

Filed Nov. 11, 1977, Ser. No. 850,751
Int. Cl.[2] A63H *3/00, 3/14*
U.S. Cl. 46—154 **7 Claims**



1. A finger puppet, comprising:

a resilient sheet of material having a pair of rigid, planar jaws formed on one surface thereof and a relatively resilient and flexible portion formed adjacent to and underlying said one surface, said jaws delineated on said one surface by a substantially straight preferential fold line for said sheet; and

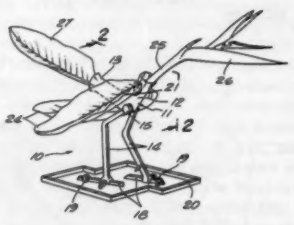
said substantially straight preferential fold line of said pair of jaws being formed such that, when said sheet is folded about said preferential fold line in a manner to close said jaws, the rigidity of said jaws delineated by said fold line forces said resilient, flexible portion of said sheet to stretch across said fold line, thus self-biasing said puppet to an open position.

4,173,843

DECORATIVE ARTICLE

Orlin G. Marble, 1216 S. Garfield Ave., Alhambra, Calif. 91801

Filed May 15, 1978, Ser. No. 905,801
Int. Cl.[2] A01G *5/00*
U.S. Cl. 47—41 R **6 Claims**



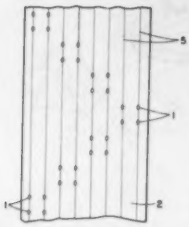
1. An article of manufacture adapted to receive and support the leaves and flower of a bird of paradise plant in a manner simulating a road runner, said article comprising a generally V-shaped tubular main body supported from the apex thereof by a pair of talon-equipped end portion, one leg of said main body being adapted to receive the stem of a bird of paradise flower simulating the neck and head of a road runner, the other end portion of said main body being adapted to receive the stem of a bird of paradise leaf simulating the tail of a road runner, and said main body including provision for supporting the stems of a pair of paradise leaves extending downwardly and rearwardly along the opposite sides of said main body simulating the wings of a road runner.

4,173,844

LAMINAR SEED CARRIERS AND METHOD OF PREPARING SAME

Jürgen C. Knolle, Eschwege, and Hans Grimm, Meinhard, both of Fed. Rep. of Germany, assignors to Saat- und Erntetechnik GmbH, Eschwege, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,335
Int. Cl.[2] A01C *7/04*
U.S. Cl. 47—56 **24 Claims**



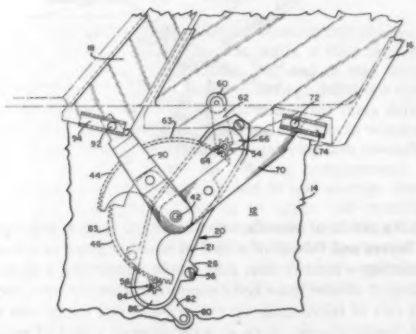
1. A method of preparing a laminar seed carrier in which a support comprising a paper web of tangled short, smooth individual fibres is provided with at least one patch of an adhesive substance, said support paper web having a weight of 15 to 25 g/m^2, a thickness of 0.01 to 0.05 mm, a breaking load of 1000 to 1500 pounds and ash content of 15 to 23 g/m^2, seeds are applied to the patch or patches of adhesive substance, an upper paper web comprising a porous web having a lower weight than the support paper web is placed over the seeds and bonded to the support paper web and is treated simultaneously with one or more powdered water-storing substances to incorporate the powdered water-storing substances within the pores of the upper paper web, said upper paper web comprising cellulose wadding having a weight of 16 to 19 g/m^2, a thickness of 0.005 to 0.02 mm and a pore volume for air of more than 20%, related to the paper surface.

4,173,845

UNITARY REGULATOR MECHANISM FOR MULTIPLE WINDOW PANELS

Max O. Heesch, Brooklyn, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,632
Int. Cl.[2] E05F *11/44*
U.S. Cl. 49—350 **6 Claims**



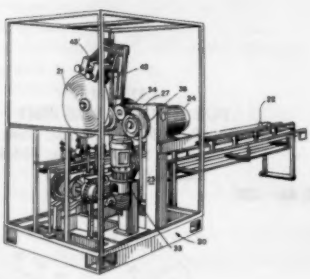
1. A mechanism adapted for controlling the reciprocating movement of a first planarly slidable window panel and a second planarly slidable window panel with each panel independently slidable between fully raised, lowered and intermediate positions independently of one another within a common sliding plane, said mechanism comprising a first rotatable operating arm and means for changing rotational movement of said arm into reciprocal movement of said first panel, a second rotatable arm and means for changing the rotational movement of said second arm into a reciprocal movement of said second second panel, a common pivotal shaft for both said arms, a sector gear secured to each arm, for causing rotation of the respective rotatable arms on rotation of said sector gears, both said sector gears mounted for rotation independently of one another on said common pivotal shaft, and means for driving each sector gear independently of the other sector gear to reciprocate the windows independently of one another, each said driving means including a pinion gear in mesh with a respective one of said sector gears, and a unitary structural plate for mounting said pinion gears and said common pivotal shaft, and wherein said unitary structural plate is configured to secure said entire mechanism to a flat wall, said plate including a central socket area for said pivotal shaft, said wall and opposed sockets spaced from said shaft for said pinion gear mountings.

4,173,846

ORBITAL SAW SHARPENING DEVICE

Gary F. Steiner, and James F. Campbell, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 23, 1978, Ser. No. 871,235
Int. Cl.[2] B24B *3/46*
U.S. Cl. 51—248 **5 Claims**



1. In an orbital saw, a frame, a disc supporting member rotatably mounted on said frame, a disc saw eccentrically mounted on said member for movement through a vertical orbit upon rotation of said member, means on said frame for rotating said disc saw independently of the rotation of said member, a conveyor mounted on said frame for advancing logs through said orbit, and a subframe equipped with a sharpening device for the edge of said saw, said subframe being journalled on said member and pivotally, slidably mounted on said frame for contacting said edge throughout the orbit thereof while maintaining a predetermined attitude relative to said saw.

4,173,847

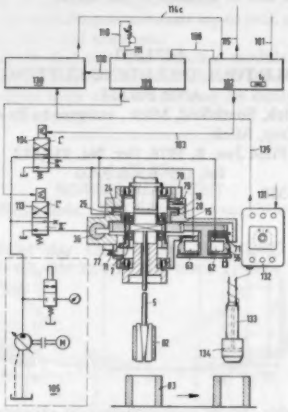
FEEDING DEVICE FOR A CHIP REMOVING TOOL FOR MACHINING BORES IN WORKPIECES, ESPECIALLY A HONING TOOL

Heinz Gehring; Albert Bender, both of Ostfildern; Günter Richter, Nabern, and Reinhard Fröschle, Ostfildern, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Gehring Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Ostfildern-Nellingen, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,483
Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619741
Int. Cl.[2] B24B *5/10*
U.S. Cl. 51—34 J **30 Claims**

12. A feeding device for a machine tool; a housing, a spindle rotatable in the housing, an axially displaceable feed rod on the

axis of said spindle having one end in said spindle and the other end adapted for connection to tool means, fluid operable piston means in the housing operable for urging said feed rod in at least one direction, feed means for incrementally adjusting the axial position of said feed rod relative to the spindle, and electric actuating means operable for automatically operating at



least feed means, load sensitive means responsive to a predetermined axial load imposed on said feed rod by a workpiece engaged by tool means on the feed rod for interrupting the incremental feeding of said feed rod, said load sensitive means comprising a lever actuated by movement of said piston means away from advanced position, and a control switch actuated by movement of said lever.

4,173,848

POLISHING DEVICE

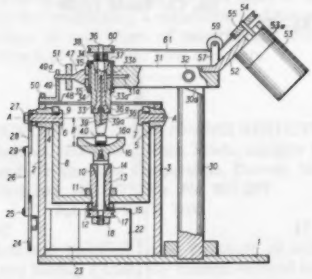
Hitoshi Ikeno, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Aug. 3, 1977, Ser. No. 821,573

Claims priority, application Japan, Aug. 3, 1976, 51-92483; Aug. 3, 1976, 51-92484; Aug. 3, 1976, 51-92485

Int. Cl.[2] B24B *13/00, 41/04*

U.S. Cl. 51—55 **6 Claims**



1. A device for polishing a convex surface of a quartz oscillator comprising a base, an oscillating member, means mounting said oscillating member on said base for oscillation about a horizontal axis, a lapping dish disposed on said oscillating member and having an upwardly facing concave spherical lapping surface having a center of curvature essentially coinciding with the axis of oscillation of said oscillating member, a support arm pivotally mounted on said base for pivotal movement about a horizontal axis between an upper raised position and a lower operative position, a hollow shaft carried by said arm in position to be essentially vertical when said arm is in operative position, said shaft having an axially extending bore, a chuck for holding a quartz blank on the lower end of said shaft in position to engage said lapping surface of said lapping dish, said chuck being supported on said shaft by a ball and socket joint permitting limited tilting of said chuck relative to said shaft and having a surface for receiving and positioning said blank and suction passages leading to said blank receiving surface, means connecting said passages with said bore of said shaft, means for applying suction to the bore of said shaft and hence to said chuck and to said passages and said blank receiving surface to hold said chuck on the lower end of said shaft by suction and to hold a blank on said blank receiving surface of said chuck by suction, means for oscillating said oscillating member about said oscillation axis and means for concurrently rotating said chuck and said lapping dish relative to one another.

4,173,849

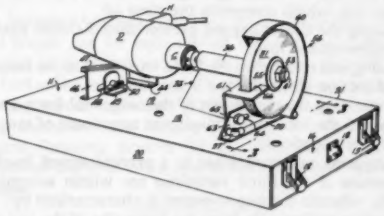
ELECTRIC HAND DRILL POWERED PORTABLE GRINDER

Sergio R. Mar, Mapimi #45, Mexico City, Mexico (2)

Filed Nov. 18, 1977, Ser. No. 852,941

Int. Cl.[2] B24B *9/00*

U.S. Cl. 51—98 R **6 Claims**

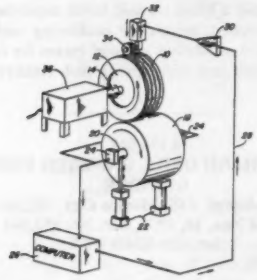


1. An electric hand drill powered tool for use with an electric hand drill having a drill body portion journalling a drive chuck at one end thereof and a hand grip portion extending sidewardly outwardly of the drill body portion, comprising, in combination, a support base structure having a flat upper surface, a drive spindle, means for journalling said drive spindle in spaced parallel relation above said flat upper surface, said drive spindle having a driven end spindle shaft portion extending outwardly of one end of said journalling means, said drive spindle having a driving end spindle shaft portion extending outwardly of other end of said journalling member, means for adjustably supporting said electric hand drill above said flat upper surface so that the chuck thereof is in rotative alignment with said drive spindle for engagement with said driven end of said spindle shaft portion, a rotatively driven tool, means for drivingly interconnecting said rotatively driven tool with said driving shaft spindle portion, said adjustable electrical hand drill supporting means comprising a first upstanding bracket fixed upon said support base structure and having an elongated upper surface portion parallel with and laterally off-set to one side of the axis of rotation of said drive spindle for supporting, from below, the hand grip portion of said electric hand drill, a second support bracket extending upwardly of said upper surface of said support base structure for supporting, from below, the body portion of said electric hand drill, the upper end of said second bracket being elongated and defining an acute angle with respect to said flat upper surface, means for adjustably securing said second bracket in the direction perpendicular to the axis of rotation of said drive spindle for accommodating hand drills having body portions of different sizes, said base support structure being of rectangular box-like structure, a cover member attachable in enclosing relation with respect to said upper surface of said support base structure, and a sliding drawer housed by said support base structure.

4,173,850
METHOD FOR REDUCING TANGENTIAL FORCE VARIATION IN PNEUMATIC TIRES

Kenneth J. Gormish, Tallmadge, and Clarence Hofelt, Jr., Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 614,381, Sep. 18, 1975, Pat. No. 4,128,969. This application Apr. 26, 1978, Ser. No. 900,399
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **1 Claim**

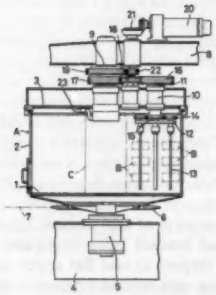


1. In a method for reducing tangential force variations in a pneumatic tire, which comprises the steps of:
(a) rotating the tire at a speed greater than 300 rpm against a predetermined load;
(b) sensing and measuring the force variations in the tangential direction while the tire is rotating;
(c) determining the magnitude of the tangential force variations and the location of maximum magnitude of tangential force variations;
(d) comparing said magnitude to a predetermined level to determine if the force variations are within acceptable limits; wherein the improvement is characterized by:
(e) grinding rubber only from the inner ribs of the tire at a reduced tire rotational speed at the location of maximum magnitude of the tangential force variations if the tangential force variations exceed acceptable limits.

4,173,851
BARREL POLISHING PROCESS

Yasunaga Higashi, 171-1, Kotsuki-cho, Kashihara-shi Nara-ken, Japan

Filed Jan. 18, 1978, Ser. No. 870,928
Claims priority, application Japan, Jan. 29, 1977, 52-8904
Int. Cl.[2] B24B *1/00, 31/02*
U.S. Cl. 51—317 **1 Claim**

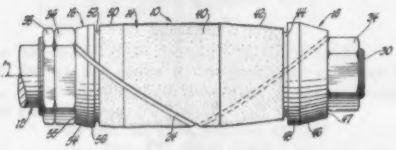


1. A process for abrading pieces to be finished, comprising rotating a barrel containing an abrasive at a sufficiently high speed to form a substantially uniform thickness layer of abrasive on the inner peripheral surface of said barrel with the density of the abrasive in the layer varying in the radial direction of the barrel and the density in the layer parallel to the axis of rotation and at any particular radius being substantially uniform, and rotating the pieces within the layer of abrasive around an axis parallel to the axis of rotation of the barrel with the pieces spaced from said parallel axis, while simultaneously rotating said pieces around an axis of the pieces which is also parallel to the axis of rotation of the barrel.

4,173,852
EXPANDABLE TOOL INCLUDING CUTTING SECTION AND PILOT

Paul Fitzpatrick, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 8, 1978, Ser. No. 913,612
Int. Cl.[2] B24B *5/00*
U.S. Cl. 51—355 **6 Claims**

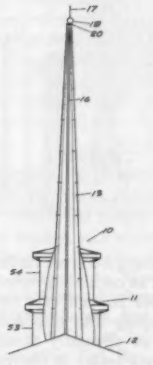


1. A rotatable cutting tool including an expandable cutting section and a leading end having an expandable pilot which expands with the cutting section; the cutting section including a cylindrical cutting portion and a tapered cutting portion of a frustoconical shape whose large end is adjacent the cylindrical cutting portion and whose small end is located adjacent the pilot, said pilot including a tapered surface of a frustoconcial shape that extends away from the cutting section, the pilot also including a cylindrical surface which is located between the tapered pilot surface and the tapered cutting portion of the cutting section, and th cylindrical surface of the pilot having a diameter which is larger than the diameter of the small end of the tapered cutting portion and slightly smaller than the diameter of the cylindrical cutting portion.

4,173,853
MODULAR CHURCH STEEPLE

Gilbert J. Logan, 502 S. 12th St., Leesburg, Fla. 32748

Filed Aug. 28, 1978, Ser. No. 937,042
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—57 **20 Claims**



1. A modular church steeple comprising in combination:
a plurality of stackable modular spire units, each of a different size from the other spire units, and each shaped to fit at least partially into the next larger spire unit through an

opening in the bottom of the next larger spire unit, and each spire unit top having a mast opening therein;

an elongated mast for assembly of each modular spire unit thereonto, said mast extending through said bottom opening and through said top mast opening of each modular spire unit;

coupling means for coupling each spire unit to the adjacent spire unit along said elongated mast;

cap means for attaching to said mast top to lock said modular spire unit onto said mast; and

means to attach said mast and attached modular spire units onto a roof, whereby a modular church steeple has stackable modular spire units which may be easily assembled into a steeple spire.

4,173,854

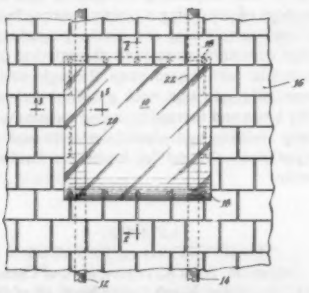
BOWED SKYLIGHT

Martin A. Wallerstein, 29 Oakwood Ave., Norwalk, Conn. 06851

Filed Mar. 13, 1978, Ser. No. 885,887

Int. Cl.[2] E04B *7/18;* **E04D** *13/03*

U.S. Cl. 52—200 **9 Claims**



1. For installation in a roof opening having at least two exposed rafters, a low cost skylight comprising:

a plurality of rafter bow members, each having a convex edge and an opposite straight edge, said straight edge being in contact with one of the exposed rafters;

a sheet of flexible, light-transmitting material overlaying said rafter bow members and extending beyond the ends of said rafter bow members;

means for securing opposite edges of said sheet to the roof;

sealing means for establishing a watertight seal between the lower surface of said sheet of material and the upper surface of each of said rafter bow members.

4,173,855

PREFABRICATED BUILDING FRAME STRUCTURE

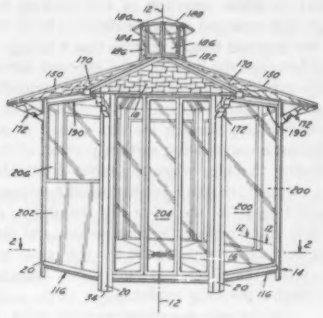
Harry C. Raptoplous, Bloomfield Hills, Mich., assignor to Obezag Design and Development Corporation, Detroit, Mich.

Filed Jun. 16, 1977, Ser. No. 807,097

Int. Cl.[2] E04B *7/00*

U.S. Cl. 52—82 **17 Claims**

1. A prefabricated building frame structure of octagonal configuration and having a centrally located vertical axis, said frame structure comprising a structural support system, said structural support system consisting essentially of eight vertical support columns of equal length and of generally identical configuration, each column being spaced an equal distance from said axis and being spaced equal distances from adjacent columns to form the octagonal configuration, the upper end portion of each of said support columns being notched to form a recess, a floor system carried by said support system above ground level, and a roof system carried solely by said eight vertical support columns of said support system, said floor and roof systems having collars, each with eight sides, said collars being vertically spaced apart and located on said vertical axis, the sides of said floor collar and said support columns having upwardly opening clips secured thereto, said floor system including joists of equal length, one for each collar side and corresponding column, said joists extending horizontally from said floor collar to said support columns, said joists being provided with downwardly extending locking flanges at the ends thereof which are interlocked with and carried by said upwardly opening clips, the sides of said roof collar and the upper end portions of said support columns being provided



with fastening brackets, said roof system including rafters of equal length one for each side of the roof collar and corresponding support column, each of said rafters extending from said roof collar in a downwardly direction towards the corresponding support column and including an end portion seated in the recess and overhanging the support column, and mechanical fastening devices for securing said rafters to the brackets of said roof collar and to the brackets of said support columns.

4,173,856

ANCHOR FOR THE TILT-UP AND TRANSPORT OF PREFABRICATED BUILDING COMPONENTS

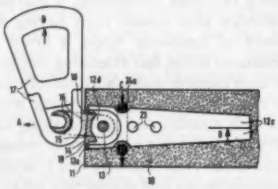
Siegfried Fricker, Wurmberger Strasse 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,815

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704435; May 5, 1977, 2720148

Int. Cl.[2] E04B *21/12*

U.S. Cl. 52—125 **20 Claims**



1. An anchor element adapted for use with a hoisting shackle of the type having a shackle body and a locking bolt which is engageable across an attachment opening of the shackle body, for the tilt-up and transport of heavy building components, such as prefabricated concrete wall members, supporting columns, and the like, which, in the course of manufacture, transportation, and installation, may have to be reoriented from a horizontal to a vertical orientation, or vice versa, the anchor element being intended to be permanently embedded in the building component, in such a way that an end portion thereof is exposed within a recess, for attachment of the hoisting shackle, the anchor element comprising:

an elongated element body of which said exposed end portion constitutes a first length portion, with a thickness which matches the width of said shackle body attachment opening, the element body having an adjoining second length portion which serves as an anchoring portion and which includes, for that purpose, means for rigidly retaining the element in the building component, when embedded therein;

a transverse hole in said exposed length portion extending through the thickness of the element body, the hole being of a size to allow insertion of said locking bolt therethrough and arranged at such a distance from the extremity of the exposed length portion that a bridge portion is formed between the hole and the exposed extremity; and

said bridge portion includes at least one longitudinal extension of the anchor element body defining at least one force-transmitting surface thereon which is oriented to abut against a cooperating surface portion of the body of the hoisting shackle, when the latter is attached to the anchor element, thereby preventing the hoisting shackle from pivoting about the pivot axis defined by said transverse hole in the exposed anchor portion and the engaged locking bolt, into contact with the wall surrounding said recess, when the shackle is pulled in a direction which creates such a pivoting tendency.

4,173,857

DOUBLE-LAYERED WOODEN ARCH TRUSS

Yoshiharu Kosaka, To-113-2, Aza konagano, Terai machi, Nomi gun, Ishikawa ken, Japan

Filed Nov. 22, 1977, Ser. No. 854,074
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—642 **1 Claim**

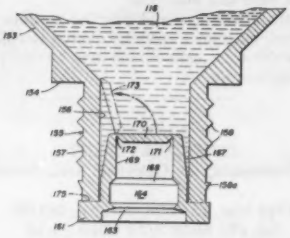
1. A building structure comprising; a plurality of double-membered wooden arch trusses each having an upper arch member formed of laminated wood, a lower arch member formed of laminated wood and extending substantially parallel to said upper arch member and spaced therefrom, a plurality of substantially radially extending connecting pillars connected between said arch member and spaced along said arch member, a plurality of reinforcing web member connected between said upper and lower arch members and extending diagonally across the space between said connecting pillars, and a plurality of metal reinforcing rods, one extending directly through each of said connecting pillars and said upper and lower arch members and having fastening means on the ends thereof for fastening said arch members and pillars into an integral structure; said trusses being positioned at spaced parallel positions along the building structure; a plurality of supporting posts, one at each end of each truss; a plate member extending along the top of the posts at each end of the trusses and having the ends of the trusses supported thereon; and a plurality of turnbuckles, one connected between the lower arch member of each truss and the plate member for adjusting the position of the truss on the plate member and constituting angle ties for said trusses.

4,173,858

SOAP DISPENSING SYSTEM

Antonio M. Cassia, Milan, Italy, assignor to Steiner Corporation, Salt Lake City, Utah

Filed Feb. 24, 1978, Ser. No. 880,766
Claims priority, application Italy, Oct. 6, 1977, 28347 A/77
Int. Cl.[2] B25B *7/28;* B67B *1/08;* B65B *51/22, 3/04*
U.S. Cl. 53—471 **25 Claims**



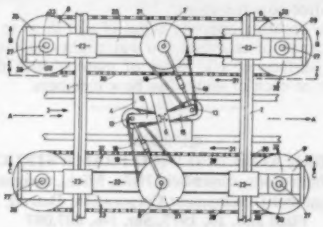
24. A method for forming an injection cartridge for use in refilling liquid soap dispensing containers, said method comprising the steps of providing a plastic squeeze bottle having a cylindrical neck terminating at a discharge end and defining a flow passage communicating with the interior of the bottle, filling the bottle with liquid soap through said neck, then inserting coaxially into said neck a cylindrical plastic sleeve closed at the inner end thereof by a thin closure wall, and then ultrasonically welding said plastic sleeve to said neck around the entire perimeter thereof for forming a fluid-tight closure for said bottle.

4,173,859

HARVESTING APPARATUS

Sydney A. Goldsmith; John A. Taylor, both of Christchurch, and Richard Kleinschafer, North Canterbury, all of New Zealand, assignors to Peco Limited, Christchurch, New Zealand

Filed Dec. 14, 1976, Ser. No. 750,405
Claims priority, application New Zealand, Dec. 15, 1975, 179552
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—330 **13 Claims**



1. A harvesting apparatus comprising,

a main frame,

ground-engaging wheels by which frame is supported,

a prime mover to effect relative movement between frame and ground,

at least a pair of spaced apart shaker head assemblies, each pair of shaker head assemblies mounted to one side of a longitudinal horizontal axis of said frame, each shaker head assembly having an input and output member each of which is mounted for rotational movement,

means disposed between said input and output members to convert high speed rotational movement into a torsional high speed vibration superimposed on said output member,

a mounting frame common to each pair of shaker head assemblies,

power transfer means which includes a transfer shaft supported by said mounting frame for transmitting high speed rotational movement to the input member of each head assembly of the pair of head assemblies of the mounting frame,

means coupling together the output members of each pair of head assemblies whereby the rotational and vibrational movement of one output member of the pair is the same as the other,

mounting means coupling said mounting frame to said main frame such as to permit said mounting frame and shaker head assemblies mounted thereon to be moveable transverse to said main frame and pivotable about the axis of said transfer shaft, and

at least one set of radially spaced tines or fingers positioned in operative connection with each output member.

4,173,860

TEXTURED SYNTHETIC FIBER YARN AND PROCESS FOR MAKING SAME

John R. McKlveen, 204 Norwood Dr., Colonial Heights, Va. 23834

Continuation of Ser. No. 554,642, Mar. 3, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,964

Int. Cl.[2] D02G *1/02*

U.S. Cl. 57—247 **6 Claims**

1. A process for making a textured continuous filament synthetic yarn consisting essentially of the steps of twisting two or more drawable fibers, drawing the fibers while in the twisted state thereby permanently fixing the twist in the fibers, and untwisting the fibers.

4,173,861

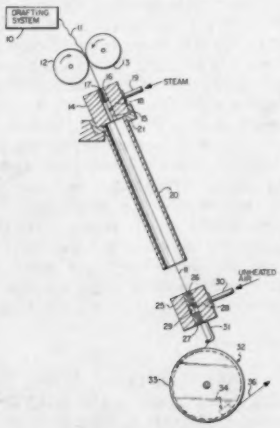
METHOD AND APPARATUS FOR CONTROLLING TWIST IN YARN

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to WWG Industries, Inc., Rome, Ga.

Filed Nov. 11, 1977, Ser. No. 850,690

Int. Cl.[2] D02G *3/28, 1/16*

U.S. Cl. 57—293 **9 Claims**



1. A method of preparing a false-twisted singles yarn for incorporation in a plied yarn to obtain an increased ratio of ply twist to singles twist therein comprising the steps of

imparting a first predetermined amount of twist to the singles yarn strand in a first direction;

heating the twisted strand to a temperature at least as great as the glass transition temperature of the material;

subsequently cooling the twisted strand below the glass transition temperature; and

imparting a second predetermined amount of twist in the opposite direction to that portion of the strand which was subjected to said twisting, heating and cooling steps.

4,173,862

BOOSTER CIRCUIT FOR ELECTRONIC TIMEPIECE

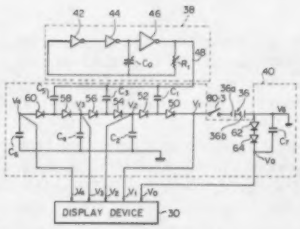
Tadahiko Nakagiri, Higashimurayama; Kunihiro Daigo, Higashiyamato; Toshiaki Oguchi, Kodaira; Toshikazu Hatuse; Toshikazu Shimazaki, both of Tanashi; Shigeru Morokawa, Higashiyamato; Minoru Natori, Tokyo, and Hiroshi Ogawa, Tokorozawa, all of Japan

Filed May 25, 1977, Ser. No. 800,251

Claims priority, application Japan, Jun. 1, 1976, 51/63831; Jun. 9, 1976, 51/66449

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 BA **4 Claims**



1. In an electronic timepiece having a power supply with first and second terminals and providing a battery voltage potential, and a source of clock pulses, a booster circuit for converting said battery voltage potential to a plurality of boosted output voltages, comprising:

boosting circuit means including a plurality of pairs of boosting diodes connected in series with the first terminal of said power supply and having outputs, respectively, a plurality of first capacitors each having one terminal connected to a junction of one of said pairs of said boosting diodes and another terminal connected to said source of clock pulses, a plurality of second capacitors each having one terminal connected to an input of one of said pairs of boosting diodes and another terminal coupled to the second terminal of said power supply, and a plurality of output leads on which said plurality of boosted output voltages appear, respectively, each of said output leads being connected between an input of one of said pairs of boosting diodes and one of said plurality of second capacitors; and

voltage compensating means connected to said second terminal of the power supply and adapted such that the current flow therethrough which is dependent upon said plurality of boosted output voltages produced by said boosting circuit means compensates for an unbalance of said plurality of boosted output voltages applied to said plurality of output leads.

4,173,863

ANALOG QUARTZ TIMEPIECE

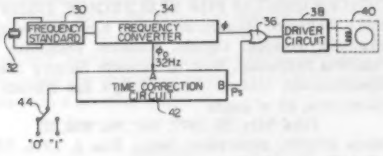
Jinro Motoki, Hoya; Singo Ichikawa, Sayama; Kenzi Miyasaka, Tokyo; Hiroyuki Uematsu, Kunitachi; Mitsuhiro Murata, Tokyo; Hideyuki Kawashima, Higashi-Kurume; Yuri Inoue, Higashimurayama; Masae Ohkubo, Niiza, and Mituo Oooka, Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,648

Claims priority, application Japan, Dec. 25, 1975, 50-159485; Mar. 19, 1976, 51-30437; Apr. 9, 1976, 51-039297; Apr. 10, 1976, 51-040531; Apr. 10, 1976, 51-40532; Apr. 19, 1976, 51-48000[U]; Apr. 19, 1976, 51-44235; Jun. 22, 1976, 51-73538[U]; Jun. 23, 1976, 51-73537; Jun. 23, 1976, 51-74201; Sep. 14, 1976, 51-110497; Sep. 14, 1976, 51-110498; Sep. 14, 1976, 51-110499

Int. Cl.[2] G04B *27/00*

U.S. Cl. 58—85.5 37 Claims



1. An electronic timepiece having a driver circuit to drive an electro-mechanical transducer connected to time-indicating hands to display time information, comprising, in combination:

a frequency standard to provide a relatively high frequency signal;

means for dividing down said relatively high frequency signal to provide a first low frequency signal as a time unit signal and a second low frequency signal at a predetermined higher frequency than said first low frequency signal;

a manually operated external control member adapted to provide set signals when said control member is actuated; and

correction signal generating means for generating high speed and low speed correction signals in response to said set signals and comprising first circuit means including timer means for generating an output signal when one of said set signals is maintained at a predetermined logic level for a prescribed time interval and gate means responsive to said output signal and said second low frequency signal to provide said high speed correction signal of said predetermined higher frequency, and second circuit means responsive to said set signals to provide said low speed correction signals when said external control member is actuated for a short time interval less than said prescribed time interval;

said driver circuit being normally responsive to said time unit signal to drive said electro-mechanical transducer to advance said time-indicating hands at a normal speed and responsive to said high speed correction signal of said predetermined higher frequency to drive said electro-mechanical transducer so as to advance said time-indicating hands at a higher than normal speed, said driver circuit being also responsive to said low speed correction signals to drive said electro-mechanical transducer so as to advance said time-indicating hands a predetermined number of steps when said external control member is actuated for said short time interval.

4,173,864

SECONDARY AIR FEED CONTROL DEVICE

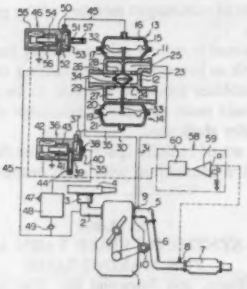
Keiso Takeda, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 8, 1977, Ser. No. 849,621

Claims priority, application Japan, Aug. 24, 1977, 52-100577

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—276 9 Claims



1. A secondary air feed control device of an internal combustion engine having an intake passage and an exhaust passage equipped with a three way catalytic converter, said device comprising:

means for detecting the total air-fuel ratio to provide a detecting signal indicating that the total air-fuel ratio is smaller than the stoichiometric air-fuel ratio;

an air pump driven by the engine;

a secondary air inlet opening into the exhaust passage located upstream of the three way catalytic converter; and

valve means comprising a valve chamber connected to said air pump, a first valve port communicating said valve chamber with said secondary air inlet, a second valve port communicating said valve chamber with the atmosphere, an air valve co-operating with said first and said second valve ports, means actuating said air valve in response to said detecting signal for reducing the opening speed of said air valve when it opens said first valve port and for increasing the closing speed of said valve when it closes said first valve port in accordance with the reduction in the level of the load of the engine, said actuating means comprises a first actuating device and a second actuating device co-operative with said first actuating device, said first actuating device comprises a first vacuum operated diaphragm apparatus for actuating said air valve to close said first valve port, said second actuating device comprises a second vacuum operated diaphragm apparatus for actuating said air valve to open said first valve port, and said first vacuum operated diaphragm apparatus has a vacuum chamber normally connected to the intake passage via a switching valve which connects said vacuum chamber to the atmosphere via a restricted opening in response to said detecting signal when the total air-fuel ratio becomes smaller than the stoichiometric air-fuel ratio.

4,173,865

AUXILIARY COIL ARRANGEMENT

George N. Sawyer, Flint, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 25, 1978, Ser. No. 899,777

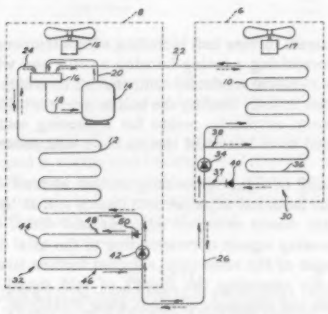
Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—324 13 Claims

9. In a refrigeration heat pump system of the type including a compressor; a fluid reversal means for switching said system between a cooling and heating mode; an indoor heat exchanger; a first flow conduit connecting said reversal means to

one end of said indoor heat exchanger; an outdoor heat exchanger; a second flow conduit connecting said reversal means to one end of said outdoor heat exchanger; a liquid line conduit connecting the other end of said heat exchangers; first expansion means in flow arrangement intermediate said liquid line conduit and said outdoor heat exchanger for permitting refrigeration flow only in the direction toward said outdoor heat exchanger, and second expansion means in flow arrangement intermediate said liquid line conduit and said indoor heat exchanger for permitting refrigerant flow only in the direction toward said indoor heat exchanger; means for conducting refrigerant in a first closed circuit path when said heat pump is operating in said cooling mode from said compressor through said reversal means to said outdoor heat exchanger, said liquid line, and then through said second refrigerant expansion means to said indoor heat exchanger and back to said compressor; said reversal means being adapted to be repositioned to place said system in the heating mode to allow refrigerant from said compressor to flow in a second closed circuit path to said indoor heat exchanger, said liquid line, and then through said first refrigerant expansion means to said outdoor heat exchanger and then back to said compressor, means for increasing the capacity of the heat pump system, comprising:

an auxiliary coil arranged in the path of air passing over said outdoor heat exchanger, flow means having a first portion connecting one end of said auxiliary coil in said system between said first expansion means, and the other end of said outdoor heat exchanger, and a second portion connecting the other end of said auxiliary coil to said liquid line so that said auxiliary coil is in parallel flow arrangement with said first expansion means;



valve means in said first portion of said auxiliary coil flow means responsive to the direction of refrigerant flow for permitting refrigerant flow only in one direction so that in said cooling mode refrigerant flow from said outdoor heat exchanger that is blocked from by-passing said auxiliary coil by said first expansion means flow through said auxiliary coil to said liquid line to provide subcooling of liquid refrigerant, and in said heating mode refrigerant is permitted to flow from said liquid line through said first expansion means and said outdoor heat exchanger with a portion of said refrigerant flowing from said liquid line through the second portion of said auxiliary coil flow means into said auxiliary coil with said portion of refrigerant being blocked from flowing therethrough by said valve means, thereby causing said portion of liquid refrigerant to be stored in said auxiliary coil;

an auxiliary coil arranged in the path of air passing over said indoor heat exchanger, flow means having a first portion connecting one end of said auxiliary coil in said system between said second expansion means and the other end of said indoor heat exchanger and a second portion connecting the other end of said auxiliary coil to said liquid line so that said auxiliary coil is in parallel flow arrangement with said second expansion means;

valve means in said second portion of said auxiliary flow means responsive to the direction of refrigerant flow for permitting refrigerant flow only in one direction so that in said heating mode refrigerant flow from said indoor heat exchanger that is blocked from by-passing said auxiliary coil by said second expansion means flows through said auxiliary coil to said liquid line to provide subcooling of liquid refrigerant, and in said cooling mode refrigerant is permitted to flow from said liquid line through said second expansion means and said indoor heat exchanger with a portion of said refrigerant passing through said second expansion means flowing through said first portion of auxiliary flow means into said auxiliary coil with said portion of refrigerant being blocked from flowing therethrough by said valve means, thereby causing said portion of gaseous refrigerant to be stored in said auxiliary coil.

4,173,866

HYDRAULIC SYSTEMS

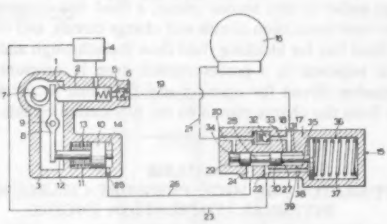
Glyn P. R. Farr, Leek Wooton, England, assignor to Girling Limited, Birmingham, England

Filed Jan. 23, 1978, Ser. No. 871,448

Claims priority, application United Kingdom, Jan. 26, 1977, 3119/77; Jan. 26, 1977, 3120/77

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—413 **11 Claims**



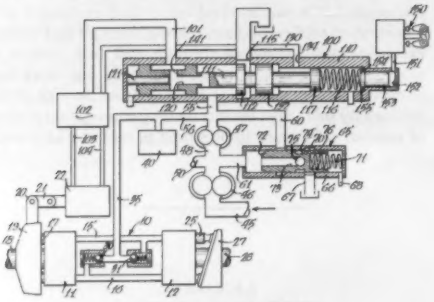
1. An hydraulic system comprising a tank for hydraulic fluid, an hydraulic accumulator, a pump for drawing hydraulic fluid from said tank to charge said accumulator, an unloader valve disposed in a supply line between said pump and said accumulator for preventing said accumulator from being overcharged and to allow said pump to re-charge said accumulator should the pressure of fluid therein fall below a desired minimum value, wherein said unloader valve incorporates a control valve, and a pressure responsive slave which is operated by fluid pressure under the control of said control valve, said control valve comprising a valve member which is movable between a first position in which said accumulator is isolated from said slave so that pump pressure is supplied to said accumulator, and a second position in which fluid pressure from said accumulator can act on said slave to render said slave operative to reduce said pump pressure or disable said pump, and a cut-out spring for biassing said valve member at all times towards said first position, said valve member having different effective areas of which a smaller area is subjected to a control pressure dependent upon the pressure in said accumulator and in response to which said valve member can move at a cut-out point from said first position into said second position, and a greater area is subjected to said pressure in said accumulator, at least when said valve member is in said second position, to determine a cut-in point at an accumulator pressure less than the pressure in said accumulator at the cut-out point and at which the valve member can move from said second position into said first position.

4,173,867

TRANSMISSION

Michael R. Schmidt, Ames, and David W. Reynolds, Huxley, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 27, 1978, Ser. No. 881,710
Int. Cl.[2] F15B *21/04*
U.S. Cl. 60—456 **19 Claims**



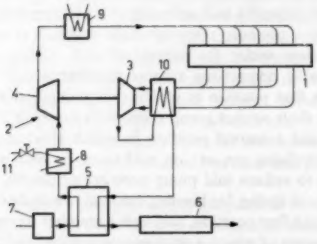
1. A transmission having hydraulic components with a lubrication circuit and a charge circuit, first and second positive displacement pumps in series with said first pump having a larger volume than the second pump, said lubrication circuit and second pump being operatively connected to the outlet of the first pump, said charge circuit being operatively connected to the outlet of said second pump, a fluid line connected between said lubrication circuit and charge circuit, and means in said fluid line for blocking fluid flow therethrough and operable in response to a predetermined drop in pressure in the lubrication circuit for opening said fluid line to permit fluid flow from the charge circuit to the lubrication circuit.

4,173,868

APPARATUS FOR HIGH PRESSURE-CHARGING AN INTERNAL COMBUSTION ENGINE

Alfred Wunsch, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 18, 1977, Ser. No. 798,081
Claims priority, application Switzerland, Jun. 29, 1976, 8280/76
Int. Cl.[2] F02B *33/42*
U.S. Cl. 60—612 **8 Claims**



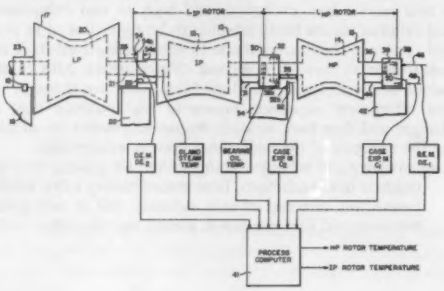
1. Apparatus for power generation, comprising:
an internal combustion engine;
an exhaust gas turbocharger machine; and
a gas-dynamic pressure-wave machine, the exhaust gas turbocharger machine and the gas-dynamic pressure-wave machine being connected in series on the exhaust gas side and on the air side with the internal combustion engine, with each machine providing one stage of a two stage combustion air compression and one stage of a two stage engine exhaust gas pressure drop.

4,173,869

APPARATUS AND METHOD FOR DETERMINING THE ROTOR TEMPERATURE OF A STEAM TURBINE

James A. Martin, Jr., Newtown Township, Delaware County; Harry F. Martin, Middletown, both of Pa., and William R. Berry, Camden, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1978, Ser. No. 876,396
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—646 **5 Claims**



1. In a steam turbine unit including a high temperature steam turbine comprising a casing housing a rotor and wherein said rotor has a critical minimum temperature to which it must be heated prior to fully loading the unit to prevent brittle fracture of said rotor, automatic means for indicating said rotor has been heated to at least said temperature, said means comrpising:
a plurality of signal generating means, at least one of said means mounted adjacent said casing and at least another of said means mounted adjacent said rotor, said means generating signals corresponding to the axial dimensional changes of the respective adjacent turbine structure;
means for receiving the signals of said signal generating means and automatically indicating therefrom, based on a known relationship between axial expansion and temperature, the temperature of the rotor relative to the minimum critical temperature.

4,173,870

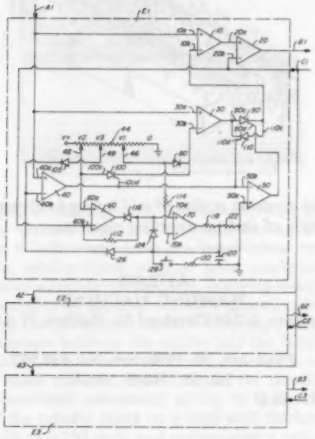
CONTROL SYSTEM AND METHOD

Judson S. Swearingen, and Leendert A. Beeloo, both of 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed Feb. 6, 1978, Ser. No. 875,183
Int. Cl.[2] F01D *17/00*
U.S. Cl. 60—702 **31 Claims**

1. A method of controlling fluid-driven systems, wherein the driving fluid is communicated to said systems through nozzles adjustable to determine the speed of operation of said systems, comprising the following steps:
(a) providing a control signal for controlling the speed of operation of such system;
(b) providing a speed signal, generated to correspond to the speed of operation of said system;
(c) generating a flow signal, based on said control signal and said speed signal, for controlling the nozzle of said system to effect the speed of operation of said system corresponding to said control signal;
(d) determining a critical speed interval, identified by a first control signal value and a second control signal value, and determining an intermediate control signal value corresponding to a speed of operation of said system within said critical speed interval;
(e) generating a protecting signal whenever the value of said

control signal is within said critical speed interval such that, for values of said control signal between said first control signal value and said intermediate control signal value, said protecting signal value is determined by the difference between said value of said control signal and said first control signal value and, for values of said control signal between said intermediate control signal value and said second control signal value, said protecting signal



value is determined by the difference between said value of said control signal and said second control signal value; and

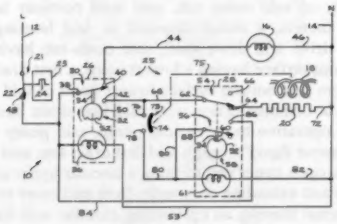
(f) generating said flow signal, when the value of said control signal is within said critical speed interval, based on a first difference between said control signal and said protecting signal, and on a second difference between said first difference and said speed signal.

4,173,871

REFRIGERATION APPARATUS DEMAND DEFROST CONTROL SYSTEM AND METHOD

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 27, 1977, Ser. No. 864,972
Int. Cl.[2] F25D *21/00*
U.S. Cl. 62—80 **11 Claims**



1. An automatically-defrosting refrigeration apparatus including a refrigerant evaporator, a heater for defrosting said evaporator, and a demand defrost control system, said demand defrost control system comprising:

a defrost control including means for establishing either a relatively shorter or a relatively longer interval between successive defrosting operations, said defrost control further including means for establishing the duration of a defrosting operation;

means for de-energizing said evaporator and energizing said heater upon initiation of a defrosting operation and for de-energizing said heater by at least the end of a defrosting operation;

a thermal sensor responsive to a predetermined evaporator temperature being reached during a defrosting operation; and

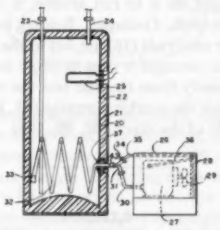
means responsive to said thermal sensor for selecting the interval before the next defrosting operation, the relatively shorter interval being selected if the predetermined temperature is not reached during a defrosting operation, and the relatively longer interval being selected if the predetermined temperature is reached during a defrosting operation.

4,173,872

WATER HEATER APPARATUS

Franklin R. Amthor, Jr., Murrysville, Pa., assignor to Energy Utilization Systems, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,328
Int. Cl.[2] F25B *27/02*
U.S. Cl. 62—238 **18 Claims**



1. In conversion of the heat source in existing electric water heaters, a hot water tank from which the lower electric resistance heating element has been removed, a heating coil inserted into the said tank through the orifice from which the said lower heating element was removed, said heating coil being helical and having inlet condenser tubing externally communicating with the compressor side of a refrigerating unit to receive hot refrigerant therefrom and being continuously sheathed along its length within said tank by a sheath tube in outwardly spaced relation to said inlet condenser tubing, outlet condenser tubing externally communicating with the evaporator side of said refrigerating unit to deliver relatively cooler refrigerant thereto and being continuously sheathed along its length within said tank by a sheath tube in outwardly spaced relation to said outlet condenser tubing, sheathed return cap engaging the innermost end of the said inlet and outlet condenser tubing and the innermost end of each said sheath tube adapted to preserve inter-space between said condenser tubing and said sheath, thermal conductive material filling the inter-space between the outside of said condenser tubing and the inside of said sheath, each said sheath terminating proximately outside said tank whereat said inter-spaces are open to the atmosphere or fragilely sealed, and a closure means outwardly engaging said sheaths and adapted to close the said orifice therearound.

4,173,873

APPARATUS ON A TEXTILE MACHINE FOR FEEDING YARN, SLIVER OR FIBROUS MATERIALS

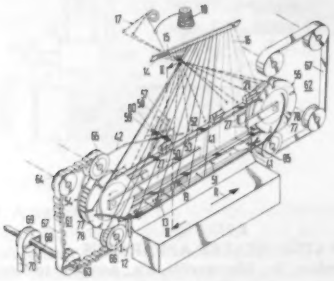
Werner Sommer, Esslingen; Antonius Vinnemann, Stuttgart; Manfred Walter, Grötzingen; Willi Gaiser, Gäufelden; Heinrich Elsässer, Stuttgart; Wolfgang Brenner, Schlierbach, and Hermann Kress, Filderstadt, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Filderstadt, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,790

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701652; Nov. 10, 1977, 2750192

Int. Cl.[2] D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 R **32 Claims**



1. Apparatus for textile machines for feeding yarn, sliver or fibrous materials, wound on to fixed supply packages, with at least one endless track, having a working section and a return section, the said track having movable material transporting elements arranged on it to run around in series wherein the track is a single-path, O-shaped, floating-mounted track (**50, 90, 103**) and the materials (**16**) are fed to the movable elements (**19**) during their successive runs through the working section (**51, 115**) alternately from the one and the other side of a surface, laid through the working section (**51, 115**) and the return section (**52, 118**) of the track (**50, 90, 103**).

4,173,874

APPARATUS ON A TEXTILE MACHINE FOR THE FEEDING OF YARNS, SLIVERS OR OTHER FIBRILLAR MATERIALS

Werner Sommer, Esslingen; Antonius Vinnemann, Stuttgart; Manfred E. Walter, Grötzingen; Willi G. Gaiser, Gäufelden; Heinrich K. Elsässer, Stuttgart; Wolfgang A. A. Brenner, Schlierbach, and Hermann Kress, Filderstadt, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Filderstadt, Fed. Rep. of Germany

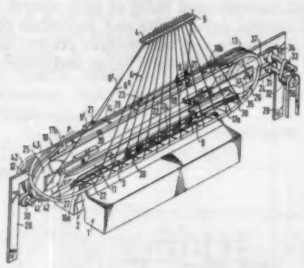
Filed Jan. 16, 1978, Ser. No. 869,757

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701652

Int. Cl.[2] D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 R **27 Claims**

1. Apparatus for feeding yarn, sliver or fibrous materials wound on stationary supply packages to a textile machine, comprising a plurality of movable material transporting elements and a plurality of movable material laying-in elements for feeding the materials from the supply packages to the textile machine, endless tracks defining working and return sections for said transporting elements and working and return regions for said laying-in elements, said transporting elements and said laying-in elements running in series on said endless tracks, and means for avoiding entwining of the materials during successive runs of said elements on said tracks having at least one deflection element by means of which the materials are fed via said transporting elements to said laying-in elements, during successive runs thereof through the working region, alternately from one and another side of a surface laid



through the working region of said laying-in elements and the return section of said transporting elements.

4,173,875

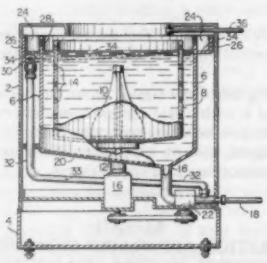
WASHING MACHINE

Otmax Suprapto, 4/245 Cleveland St., Redfern, N.S.W., Australia

Filed Jun. 30, 1978, Ser. No. 920,957

Int. Cl.[2] D06F *39/08*

U.S. Cl. 68—18 D **2 Claims**



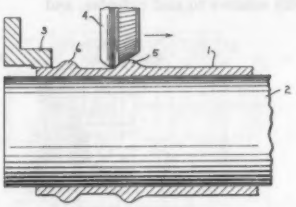
1. A washing machine comprising a housing, a generally cylindrically-shaped outer tub disposed in said housing, an inner tub disposed within said outer tub, a vertical drive shaft disposed centrally of said inner tub, an agitator fixed to said vertical drive shaft, said inner tub having upstanding wall portions generally cylindrically-shaped and disposed generally concentrically of said outer tub, said wall portions having perforations therein, a motor disposed in said housing and operative to drive said drive shaft, said outer tub having an inclined bottom surface having a lowest point, a first drain line extending from said bottom surface lowest point of said outer tub, a pump in communication with said first drain line, said motor being operative to drive said pump, said pump being operative to move liquid through said first drain line, said outer tub having an open upper end forming a circular upper edge, a floor fixed to and extending outwardly from said outer tub and generally normal thereto, an upstanding circular wall fixed to an outer circular edge of said floor to define an annular open-top chamber bounded by said outer tub cylindrical wall and said upstanding circular wall, said outer tub cylindrical wall having holes therein placing said chamber in communication with upper regions of said outer tub, said floor of said chamber being inclined in its extent about said outer tub to define a chamber lowest point, a second drain line extending from said annular chamber lowest point and connected to said first drain line, and a one-way valve disposed in said second drain line and permitting flow from said chamber lowest point to said first drain line.

4,173,876

METHOD OF PRODUCING METAL TUBING

Kenneth A. Schaefer, Brookfield, Wis., assignor to Nudyne Corporation, Brookfield, Wis.

Filed Mar. 27, 1978, Ser. No. 890,361
Int. Cl.[2] B21D *22/16*
U.S. Cl. 72—83 6 Claims



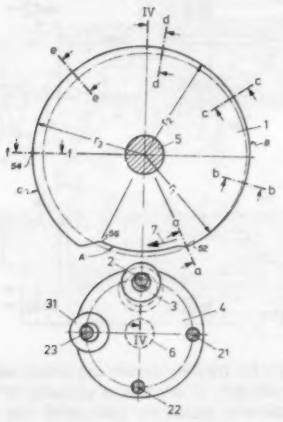
1. A method of making metal tubes, comprising the step of producing a welded steel tubular blank having a diameter greater than 6 inches and having a longitudinal weld seam, disposing the tubular blank without prior machining on the outer surface of a cylindrical mandrel, applying radial pressure through a plurality of circumferentially spaced rollers to the outer surface of the tubular blank, affecting relative linear feeding movement between the rollers and the tubular blank, effecting relative rotational movement between the rollers and the tubular blank the axis of said blank, the combination of linear and rotational movement acting to reduce the wall thickness of the tubular blank to a final wall thickness in the range of 0.110 to 0.250 inch, and maintaining a ratio between the speed of linear movement in inches per minute and the speed of rotational movement in revolutions per minute per inch of tube diameter in the range of 0.006 to 0.012.

4,173,877

RING ROLLING MACHINE

Heinz Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,559
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715611
Int. Cl.[2] B21H *1/06*
U.S. Cl. 72—105 7 Claims



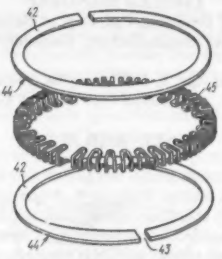
1. A ring rolling machine for rolling a ring blank engaged over a mandrel roll which has an outside diameter smaller than the inside diameter of the ring blank, comprises a rotatable main roll having an annular curved surface, means rotatably supporting said main roll for rotation about an axis at a fixed distance from said mandrel, said surface being divided into a loading zone having a radius less than the spacing from said main roll axis to said ring blank, a rolling zone having a variable radius being curved with a constantly increasing value and including at least a portion of a radius to engage the ring blank during rotation to roll the ring blank to a defined shape, and a rounding zone extending between said rolling zone and said loading zone of a substantially constant radius.

4,173,878

METHOD OF MANUFACTURING TANGENTIAL EXPANDERS FOR OIL CONTROL PISTON RINGS

Rusnam S. Nemets, Sirenevy bulvar, 57, kv. 50; Efim S. Gorbulev, Tovarischesky pereulok, 9/11, kv. 5; Veniamin A. Parygin, ulitsa Malysheva, 18, kv. 200, all of Moscow; Jury M. Kontsov, ulitsa Krasnova, 1, kv. 58, Odessa; Viktor P. Moldavanov, Pionerskaya ulitsa, 10, kv. 6, Odessa; Mark A. Shaforenko, Sredne-Fontanny pereulok, 16/18, kv. 75, Odessa; Alexei K. Ignatiev, Volgogradsky prospekt, 71, kv. 167; Gennady S. Zaikovsky, Matveevskaya ulitsa, 4, korpus 1, kv. 148, both of Moscow, and Mikhail I. Volnyakov, ulitsa Malinovskogo, 31, kv. 95, Odessa, all of U.S.S.R.

Filed Jan. 17, 1978, Ser. No. 870,176
Int. Cl.[2] B23P *15/06*
U.S. Cl. 72—137 2 Claims



1. A method of manufacturing tangential expanders for oil control piston rings comprising the following operations: flattening round wire into a rectangular strip with rounded edges; bending the initial serpentine flat spring from said strip; forming thrust shoulders from segment portions of the serpentine spring; calibrating the thrust shoulders for height with simultaneous fixing of the serpentine spring along the pitch of its waves; bending a U-shaped profile in the cross section of the initial spring; coiling said spring into a spiral on a mandrel; heat-hardening the spiral fixed in a compressed state on the mandrel; and cutting said spiral into measured lengths, each constituting a tangential expander in the shape of an all-bent spring ring.

4,173,879

METHOD AND APPARATUS FOR FORMING A METAL STRIP

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Netherlands

Filed Dec. 29, 1977, Ser. No. 865,395
Int. Cl.[2] B21D *5/08*
U.S. Cl. 72—179 22 Claims

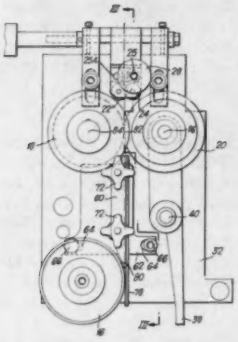
1. A method of forming a thin metal strip into a non-twisted slat with a shape having a transverse concave-convex bow, which metal strip may have stress therein tending to create twist in the finished slat, said method comprising the steps of:

(a) providing a supply of metal strip;

(b) feeding the strip to the nip of a pair of rolls rotatable about parallel axes and having complementary male and female peripheral forming surfaces;

(c) guiding the strip over a substantially straight path upstream of the nip of said forming rolls; and

(d) compensating for any twist inducing stress in said strip by adjusting the relative feed direction of the strip during said



guiding with respect to said rolls in a plane passing through the nip and parallel to said axes.

4,173,880

COOLED MANDREL

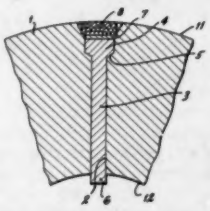
Helmut Landgraf, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 894,024

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2716315

Int. Cl.² B21B *25/04*

U.S. Cl. 72—201 **8 Claims**



1. A thick-walled hollow mandrel for rolling mills improved as follows:

a plurality of radial bores in said mandrel wall arranged regularly in an axial as well as in a circumferential direction;

a plurality of cooling fingers inserted in said bores and being composed of a good thermo-conductive material, said fingers having head portions respectively positioned in said radial bores in recessed relation to an outer surface of the mandrel; and a plurality of plugs of wear resistant metal which fill said recesses, said plugs comprising cladded layers of weld-deposited metal.

4,173,881

ROLLING STAND WITH HYDRAULIC ADJUSTMENT OF THE MILL ROLLS

Heinrich Rose, Kreuztal, Fed. Rep. of Germany, assignor to Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,144

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726140

Int. Cl.² B21B *31/32*

U.S. Cl. 72—245 **9 Claims**

1. The combination in a rolling-mill stand of:

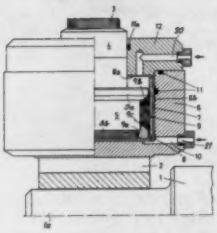
at least one displaceable roll provided with a bearing block and shiftable to adjust a rolling gap of the stand;

at least one spindle rotatable for shifting said roll and in force transmitting relationship therewith; and

a hydraulic device disposed between said spindle and said block, said hydraulic device comprising

a cylinder pressurizable with a hydraulic medium at an elevated pressure, and a piston slideable in said cylinder,

a sliding packing surrounding said piston and displaceable therewith relative to said cylinder, and



a cylinder sleeve received within said cylinder and disposed between said packing and the cylinder wall, said sleeve being fixed relative to the cylinder, said device being provided with means for equalizing hydraulic medium pressure between the inner and outer surfaces of said sleeve upon pressurization of said cylinder, said sliding packing engaging said sleeve.

4,173,882

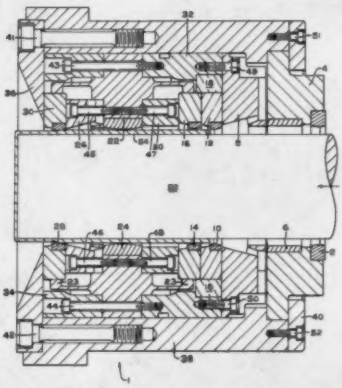
MOUNTING FOR IRONING DIES

Harry W. Lee, Jr., Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 24, 1978, Ser. No. 927,347

Int. Cl.² B21D *22/28*

U.S. Cl. 72—349 **7 Claims**



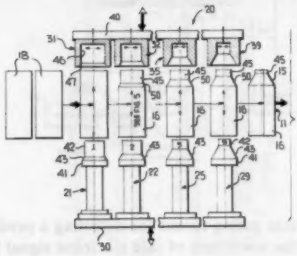
1. In a die set for forming drawn and ironed metal articles comprising a plurality of die nibs, a plurality of die casings holding said die nibs, means for lubricating said die set and means for deflectably mounting said die nibs and die casings the improvement wherein said means for deflectably mounting said die nibs and die casings comprises a metal ring having a plurality of metal fingers extending from said ring along its axis, said fingers having sufficient spring strength to permit said die nibs and die casings to deflect from and return to their original axially centered position.

4,173,883

NECKED-IN AEROSOL CONTAINERS

Arnold R. Boik, Orland Park, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,924
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—354 **9 Claims**



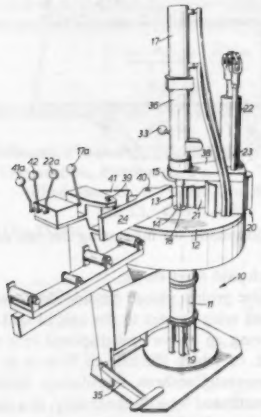
1. An apparatus for progressively necking-in an end portion of a tubular member, said apparatus comprising a plurality of inside tools each having a base portion of a first diameter, a free end portion of a second and lesser diameter, and a frustoconical intermediate portion, the first diameters of said inside tools being identical, the second diameters of said inside tools progressively decreasing, and said frustoconical intermediate portions progressively axially increasing in length, and an outside tool cooperable with each inside tool.

4,173,884

FORMING MACHINE FOR BENDING METAL BARS

Reginald P. Dobinson, 290 Murray St., Rockhampton, Queensland, Australia

Filed Feb. 15, 1978, Ser. No. 878,020
Int. Cl.[2] B21D *7/024*
U.S. Cl. 72—387 **9 Claims**



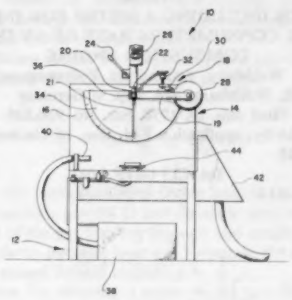
1. A forming machine including a table supported on a main frame and rotatable about a support axis; a mandrel adapted to extend from said table about said support axis; a selectively positionable back-stop member supported on said main frame and adapted for operative engagement with the workpiece to be formed about said mandrel; a jaw assembly on said rotatable table and adapted to be actuated to clamp said workpiece against said mandrel; means for rotating said table to form said workpiece about said mandrel, and means for axially displacing said mandrel to clear same from the formed workpiece.

4,173,885

STANDARD SURFACE ASSEMBLY FOR CALIBRATING A VARIABLE SPEED FRICTION TESTER

Tony L. Matlock, 4026 Greenleaf St., Raleigh, N.C. 27606

Filed Sep. 26, 1978, Ser. No. 945,874
Int. Cl.[2] G01L *25/00*
U.S. Cl. 73—1 R **9 Claims**



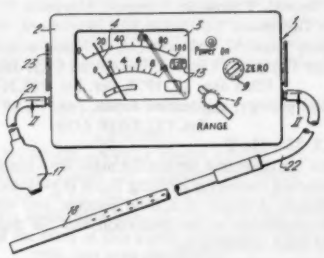
1. In a variable speed friction tester for testing pavement surfaces and determining the effective skid resistance thereof of the type including a frame structure with a pendulum type swing arm having a rubber wheel secured to one end and locked in at least one direction in order that the wheel will skid over an underlying surface during a test swing of the pendulum, the improvement comprising a standard surface assembly for calibrating said variable speed friction tester, said standard surface assembly including: base means adapted to be secured about the frame structure of said variable speed frictional tester and disposed such that during the testing operation said pendulum will swing thereover; a standard surface material secured about said base means and exposed such that the rubber wheel of said variable speed friction tester will engage the same as the pendulum is swung across said base means during the testing operation, and wherein said standard surface material is sufficiently porous to allow fluid to move therethrough; and means associated with said base means for directing fluid through said standard surface material for purging the same of foreign material such as rubber particles deposited by the rubber wheel.

4,173,886

GAS DETECTORS

Thomas Archbold, Whitley Bay, and Michael R. G. Sharp, Seaton Sluice, both of England, assignors to British Gas Corporation, London, England

Filed Jun. 27, 1978, Ser. No. 919,564
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—23 **9 Claims**



1. A portable gas detector having means for aspirating a sample of the atmosphere to be tested through a flow line in the detector into the vicinity of its gas-sensing means, and having

a water-trap associated with said flow line, wherein said water trap comprises valve means arranged, in response to a drop in pressure which occurs in the flow line through the instrument when water is accidentally sucked into the probe with an aspirated sample, to interrupt the flow of said water-containing sample through the flow line of the instrument.

4,173,887

APPARATUS INCLUDING A METER FOR INDICATING THE FUEL CONSUMPTION RATE OF AN INTERNAL COMBUSTION ENGINE

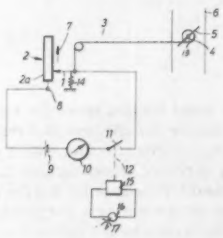
Ernst Fiala, Wolfsburg, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,536

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731545

Int. Cl.[2] G01F *9/00*

U.S. Cl. 73—114 **8 Claims**



1. A device for indicating the fuel consumption rate of an internal combustion engine comprising:

(a) potentiometer means having a sliding contact engaging resistance means for providing variable resistance between said contact and an output lead of said potentiometer;

(b) means connecting said sliding contact with the fuel proportioning means of the engine for adjusting the position of said contact such that the resistance between said contact and said output lead increases as the amount of fuel supplied to the engine increases;

(c) electrical circuit means comprising, in series, a voltage source, a meter responsive to the current in said circuit for indicating fuel consumption rate, said potentiometer means connected at said contact and said output lead, and circuit interrupting means; and

(d) means for actuating said circuit interrupting means to open said electrical circuit only when the fuel proportioning means is in the idling position.

4,173,888

PEAK POINT DETECTOR FOR IONIZED MASS FLOW RATE MEASUREMENT

Suzuo Suzuki, Yokosuka; Hiroyuki Maruoka, Yokohama; Setsuzo Tachibana, Yokosuka; Yuji Matsubara, Yokohama, and Hatsuo Nagaishi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Jan. 13, 1978, Ser. No. 869,245

Claims priority, application Japan, Jan. 14, 1977, 52/3337

Int. Cl.[2] G01F *1/56*

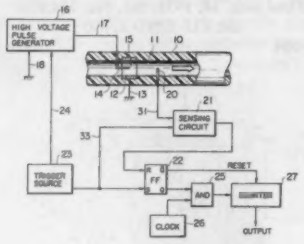
U.S. Cl. 73—194 F **7 Claims**

7. An ion detecting device for mass flow measuring apparatus including means for ionizing fluids at periodic intervals at a predetermined point of a fluid passage and time measuring means responsive to the ionization and the detection of said ionized fluid, comprising:

a charge collecting electrode in said passage located at a known distance downstream from said predetermined point to produce an electrical signal in response to the proximity thereto of an ionized flow mass;

gating means normally operative to pass said electrical signal and prevent the passage of said signal for a short interval from the time of said ionization; and

voltage sensing means responsive to the signal passing



through said gating means for detecting a predetermined point of the waveform of said electrical signal for signaling said time measuring means as a point of detection of said ionized flow.

4,173,889

ULTRASONIC FLOWMETER

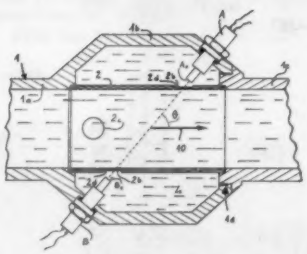
Michel Forster, and Pierre Rampin, both of Valence, France, assignors to Crouzet, Paris, France

Filed Mar. 20, 1978, Ser. No. 888,250

Claims priority, application France, Mar. 25, 1977, 77 09251

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **2 Claims**



1. An ultrasonic flowmeter for measuring the rate of flow of a fluid, comprising:

a conduit in which said fluid flows;

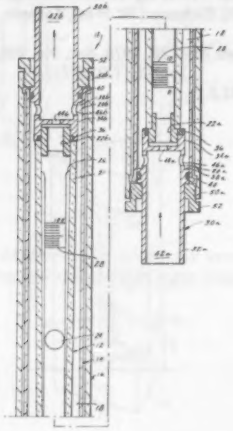
at least two acoustic probes placed outside the flow of fluid on a line inclined with respect to the axis of said conduit, said probes having an active end disposed in a recess in which the fluid, of which the rate of flow is to be measured, may penetrate without circulating therein, said recess being constituted by a discontinuity, in a measuring zone, of the inner wall of the conduit; and

a sleeve disposed in said discontinuity provided with openings through which the fluid may pass, said sleeve having an internal diameter essentially equal to an internal diameter of said conduit for ensuring continuity of the flow of fluid, said conduit comprising a first conduit part and a second conduit part, said first and second conduit parts threadably interconnected, said first part comprising, near said threadable connection, a swell, said swell comprising said discontinuity and in combination with said sleeve, forming an annular chamber.

4,173,890
BY-PASS FLOWMETER

Roger Gilmont, Douglaston, N.Y., assignor to Gilmont Instruments, Inc., Great Neck, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,305
Int. Cl.[2] G01F 5/00
U.S. Cl. 73—202 **12 Claims**

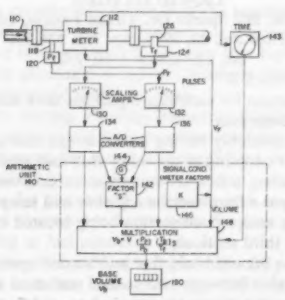


1. A by-pass flowmeter of coaxial design comprising:
(A) an outer tube having a viewing station;
(B) a rotameter coaxially disposed within said outer tube to define therewith an annular by-pass chamber, said rotameter and said by-pass chamber each including a fluid inlet and a fluid outlet;
(C) inlet means at least partially disposed within said outer tube and in fluid communication with both said rotameter inlet and said by-pass chamber inlet; and
(D) outlet means at least partially disposed within the outer tube and in fluid communication with both said rotameter outlet and said by-pass chamber outlet.

4,173,891
METHOD AND APPARATUS FOR MEASURING GAS FLOW

Nira C. Johnson, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 12, 1978, Ser. No. 869,004
Int. Cl.[2] G01F 1/90
U.S. Cl. 73—231 M **21 Claims**



1. A measuring and calculating system for providing with high accuracy a manifestation of base gas volume V_b adjusted to given base conditions of pressure P_b and temperature T_b of a gas flowing through a conduit, said system comprising:
(a) first means for measuring the temperature T_f of the gas flowing through the conduit and for providing a first electrical signal indicative thereof;
(b) second means for measuring the pressure P_f of the gas flowing through the conduit and for providing a second electrical signal indicative thereof;
(c) third means for measuring the volume V_f of the gas flowing through the conduit and providing a third electrical signal indicative thereof; and
(d) calculating means for calculating base gas volume V_b in accordance with the following equation:

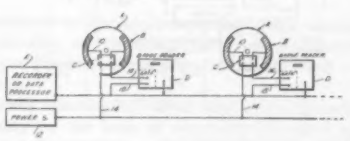
$$V_b = (V_f)\left(\frac{P_F}{P_b}\right)\left(\frac{T_b}{T_F}\right)(S)$$

where S is the compressibility factor and is calculated as a function of specific gravity G and the mole percentages of the constituents of the gas flowing through said conduit, P_F equals P_f + atmospheric pressure base and T_F equals $459.67 + T_f$, said calculating means further including:
(1) means for entering a value of the specific gravity G and the mole percentages, and
(2) means for performing a series of calculating cycles for obtaining intermediate values of the factor S, whereby an accurate manifestation without approximation of values of S is obtained as a function of the first and second electrical signals, and the entered values of specific gravity G and mole percentages.

4,173,892
APPARATUS FOR MEASUREMENT OF QUANTITY OF LIQUID IN CONTAINER

Boris Khurgin, 14 David Marcus, Haifa, Israel

Filed May 8, 1978, Ser. No. 903,617
Claims priority, application Israel, Nov. 20, 1977, 53430
Int. Cl.[2] G01F 23/26
U.S. Cl. 73—304 C **15 Claims**



1. Apparatus for generating a signal proportional to the quantity of the substance in a container composed of electrically non-conducting material, the apparatus comprising a pair of electrically isolated electrodes, mounted on the outside surface of the container, in face-to-face relationship on opposite sections thereof, such that the substance to be measured is situated therebetween, a dielectric coating covering said electrodes, and means, operatively connected to said electrodes, for measuring the capacitance of said electrodes and for generating an output signal proportional to said measured capacitance.

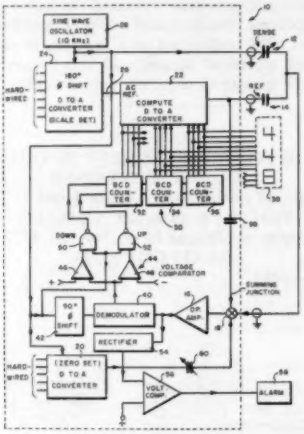
4,173,893
FLUID QUANTITY INDICATOR

Geoffrey S. Hedrick, Laurel Clr., Malvern, Pa. 19355

Continuation-in-part of Ser. No. 731,229, Oct. 12, 1976, Pat. No. 4,090,408. This application Dec. 12, 1977, Ser. No. 859,670
The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.
Int. Cl.[2] G01F 23/26
U.S. Cl. 73—304 C **15 Claims**

1. In an apparatus responsive to the quantity of a fluid within a container therefor of predetermined volume, said apparatus

comprising a capacitive sensing means disposed within said container volume so as to be immersible within said fluid and any air within said container volume, said capacitive sensing means having an associated variable dielectric constant, said dielectric constant being proportional to the proportionate amount of fluid within said container volume, said sensing means capacitance varying in accordance with the variation in said proportionate amount of fluid; a reference capacitive means disposed within said container so as to normally be immersible within said fluid and responsive to variations in the dielectric constant of said fluid due to environmental conditions; the improvement comprising AC reference means operatively connected to said sensing means for providing a signal having a predetermined phase and frequency thereto; first microprocessor control means for providing a control signal output indicative of said fluid quantity; first digital-to-analog conversion means having a magnitude input operatively connected in parallel to said first microprocessor control means control signal output for providing an output in response to said input, said first digital-to-analog conversion means output being operatively connected to said reference capacitive means, said output comprising a signal having a predetermined phase opposite to said AC reference means signal phase and a predetermined frequency identical therewith; said first microprocessor control means being programmable to enable a



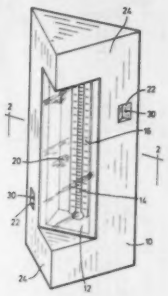
universal apparatus full scale set compensation for containers for said fluid substantially independent of said container configuration for compensating for variations in full scale capacitance of a given container and to directionally count in response to directional counting command signals provided thereto; first differential amplifier summing means having an input operatively connected to said capacitive sensing means and said capacitive reference means outputs for summing the output signals provided therefrom; first means operatively connected to said first summing means output for providing a directional counting command signal in response to said first summing means output, said counting command signal being operatively connected to said first microprocessor control means input, said first microprocessor control means counting in response to said directional counting command input signal for providing a display control signal output dependent thereon, said first microprocessor control means output further being operatively connected in parallel to a digital display means for controllably providing a digital of said fluid quantity on said digital display means in response to said display control signal output; said AC reference means capacitive sensing means, capacitive reference means, first summing means, first directional counting signal providing means, first microprocessor control means and first digital-to-analog conversion means comprising a first independent digital servo control loop which is nulled when said first microprocessor control means output is equivalent to said fluid quantity, whereby a container configuration independent real time digital display of fluid quantity within a given container is provided.

4,173,894

PORTABLE TEMPERATURE SENSING DEVICE

Andy Gerike, 133 Richmond St. West, Toronto, Ontario, Canada (M5H 2L7)

Filed May 30, 1978, Ser. No. 910,498
Int. Cl.[2] G01K 1/16
U.S. Cl. 73—362.8 **4 Claims**



1. A temperature sensing device adapted to maximize heat transfer from surrounding conditions comprising a frame of thermal material provided with a sealed cavity, a temperature measuring instrument in said sealed cavity operable over a range of temperatures, a thin metal heat transfer plate having a high thermal conductivity extending from said cavity projecting slightly beyond the exterior surface of said frame for presenting a planar heat transfer face for intimate contact which such planar surface and means for reading said temperature measuring instrument and being adapted to provide readout over said range of temperatures, said temperature measuring instrument being in contact with said heat transfer plate, said planar heat transfer face defining the area of thermal contact with such planar surface, said thin metal plate occupying a major portion of the surface area of said exterior surface of said frame for maximizing heat transfer to said temperature measuring instrument and for minimizing response time of said temperature sensing device; said frame being resilient for deformation about said plate to essentially isolate it from thermal effects of surrounding conditions when in use.

4,173,895

APPARATUS FOR AND METHOD OF SAMPLING LIQUID OXYGEN

Lloyd A. Pecor, 502 Sparks Dr., Grand Prairie, Tex. 75051

Filed Jul. 20, 1978, Ser. No. 926,294
Int. Cl.[2] G01N 1/10, 1/22
U.S. Cl. 73—421.5 R **11 Claims**

1. An apparatus for sampling liquid gas with minimum contamination comprising

a manifold assembly having a vent at one end and a sample container coupling at the other end; said manifold assembly including a first section adjacent said vent, a second section and a third section adjacent said sample container coupling, said second section being located between said first and third sections;

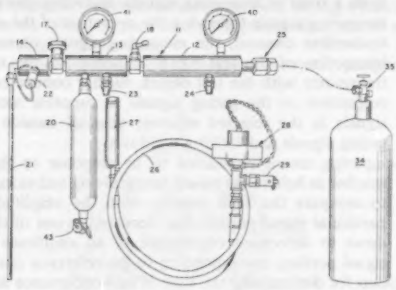
a first valve between said first and second sections;

a second valve between said second and third sections;

a conduit purge connector attached to said first section;

a sample receiving cylinder coupled at one end to said second section, the other end of said cylinder having a conduit fitting; and

a flexible conduit having a quick disconnect fitting at one end and a unit coupling at its other end; said quick disconnect fitting adapted to be selectively connected to said conduit fitting and said conduit purge connector.



4,173,896

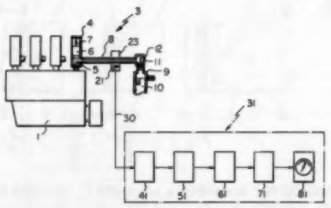
DEVICE FOR MEASURING ROTATIONAL SPEED OF A DIESEL ENGINE

Teruhiro Takama, Hino, Japan, assignor to C. Itoh & Co. Ltd., Osaka and Okuda Koki Co., Ltd., Tokyo, both of, Japan

Filed Aug. 23, 1978, Ser. No. 936,123

Int. Cl.[2] G01P *3/48*

U.S. Cl. 73—518 **12 Claims**



1. A device for detecting the rotational speed of a diesel engine with a fuel injection system comprising:

a sensor element, adapted to be mounted on said fuel injection system and having an intrinsic resonance frequency which is considerably larger than the rotational speed of said diesel engine to be measured, for transmitting a high frequency electric signal in response to a high frequency oscillation generated in the fuel within said fuel injection system when said fuel is injected;

an amplifier, having a tuning frequency which is substantially the same as said intrinsic resonance frequency of said sensor element, for tuning and amplifying said high frequency signal from said sensor element;

a converter for converting said tuned and amplified high frequency electric signal into a low frequency signal corresponding to fuel injection, and;

a wave shaping circuit for shaping said low frequency signal from said converter into a pulse signal having a predetermined amplitude and a predetermined pulse width, said wave shaping circuit applies said pulse signal into an indicator in accordance with said rotational speed of said diesel engine.

4,173,897

METHOD OF ADJUSTING ULTRASONIC TEST SYSTEMS

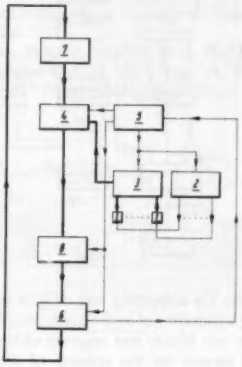
Ulrich Förstermann, Sprockhövel; Hans-Peter Schäfer; Peter Möller, both of Wuppertal; Karl Ries, Mülheim; Dieter Lather, Rheurdt, and Klaus-Uwe Jannsen, Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,148

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632680

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—609 **9 Claims**



1. In a method for ultrasonic inspection of structural material using a plurality of transmitter and receiver channels, and wherein the channels of the plurality are operated in steps, comprising:

sequentially selecting individual ones of the channels of the plurality on the basis of externally provided selection signals including for each selection operating the selected transmitter for launching a test signal and timing the selected receiver channel responsiveness on the basis of externally provided timing signals, to provide a sequence of tests in accordance with the sequential selection;

processing signals as received through the sequentially operated receiver channels by a common circuit to obtain test data for each test and including in each instance of selection the providing for selective gating the common circuit including gates being adjustable as to timing for opening and closing on the basis of second timing signals constituting timing parameters, and the common circuit being further adjustable as to processing said signals as received, for the acquisition of particular amplitudes and transit times on the basis of additional operating parameters;

preparing the common circuit for each test by feeding the second timing signals and the signals representing the operating parameters to the common circuit, separately for each selection of a transmitter and receiver channel; and

updating the signals representing timing and operation parameters to be used in a subsequent test on the basis of the test data information acquired as per the processing step during one or several tests preceeding the subsequent test.

4,173,898
SYSTEM FOR NONDESTRUCTIVE, ULTRASONIC TESTING OF TEST OBJECTS

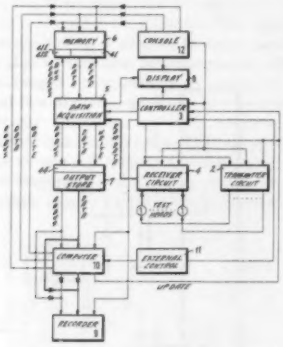
Ulrich Förstermann, Spröckhovel; Hans-Peter Schäfer; Peter Möller, both of Wuppertal; Dieter Lather, Rheurdt; Karl Ries, Mülheim, and Klaus-Uwe Jannsen, Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,149

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632674

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—611 28 Claims



1. In a system for inspecting test objects by means of ultrasonics, having a plurality of individually enablable and triggerable ultrasonic transmitter and receiver channels, further having a control circuit for the control of these channels, the control circuit comprising:

a memory including a plurality of addressable locations, each location of the plurality holding a plurality of different numbers which include time count numbers for the beginning and end of gating signals, and amplitude limit or reference numbers;

a controller for providing a sequence of test identification numbers, each number identifying a particular test involving a particular transmitter and receiver channel;

means connected for accessing the memory locations of the plurality in response to the test identification number to obtain a read-out of content of the accessed memory location, the contents of different memory locations being read out in accordance with said sequence of test identification numbers;

storage means connected for receiving and storing the content of the accessed memory location as read out therefrom, including for each test so identified the time count numbers and at least one amplitude limit or reference number, the storage means receiving a new content for each test;

a time counter means operating to count clock pulses;

gating signal generator means including comparator means, and connected to receive the time count numbers from the means for receiving and storing and further connected to the counter for comparing the count numbers with the running time counts as counted by the time counter to generate gating signals in response thereto, the gating signals establishing looking windows;

means connected to the controller for selecting and operating the particular transmitter channel in response to the test identification numbers to cause the channel to launch an ultrasonic test signal into a test object so that a sequence of tests is conducted in accordance with the sequence of test identification numbers as provided by the controller and wherein different test identification numbers involve different transmitter and receiver channels as selected, each test including the launching of a test signal by the transmitter in the selected channel;

means connected to the receiver channels to receive therefrom a train of measuring signals, including particularly measuring signals following the operation of the selected transmitter channel, the measuring signals representing interaction of the test signal launched by the selected transmitter with the test object, further connected to be responsive to the gating signals to suppress measuring signals in the selected receiver channel outside of the gating signals and looking windows;

comparing means connected to be response to the limit number as held in the means for receiving and storing, and to compare the limit number with the amplitude of a particular signal portion that occurred in one of the windows to determine occurrence of an amplitude in the signal portion, corresponding to the reference number;

means for determining the time of said occurrence and providing a representation thereof as a measuring result; and

processing means for updating said numbers as held in the several locations of the memory on the basis of measuring signals as occurring in particular ones of the said windows.

4,173,899
METHOD AND DEVICE FOR SCANNING BY MEANS OF A FOCUSED ULTRASONIC BEAM

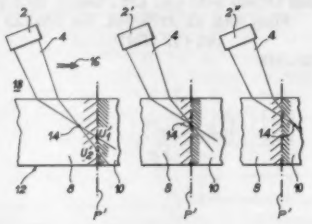
Jean Perdijon, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 12, 1978, Ser. No. 905,518

Claims priority, application France, May 16, 1977, 77 14886

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—620 6 Claims



1. A method for scanning a segment C' located in a second medium by means of a focused ultrasonic beam formed by a focusing transducer placed in a first medium, said first and second media being separated by an interface, wherein a focal point of the ultrasonic beam is displaced in order to scan the segment C' aforesaid by displacing the focus of the transducer along a segment C which is the optical image of the segment C' in said interface.

4,173,900
SEMICONDUCTOR PRESSURE TRANSDUCER

Masanori Tanabe; Satoshi Shimada, both of Hitachi; Motohisa Nishihara, Katsuta; Kazuji Yamada, Hitachi; Yasumasa Matsuda, Hitachi; Michitaka Shimazoe, Hitachi; Yoshitaka Matsuoka, Mito; Yukio Takahashi, Katsuta; Katsuya Katohgi, Katsuta, and Mitsuo Ai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 6, 1978, Ser. No. 883,589

Claims priority, application Japan, Mar. 7, 1977, 52/25045; Mar. 7, 1977, 52/25046; Mar. 17, 1977, 52/29678

Int. Cl.[2] G01L *9/06*

U.S. Cl. 73—727 8 Claims

1. A semiconductor pressure transducer comprising:

(a) a disc-shaped diaphragm of single crystal semiconductor material;

(b) at least one radial strain gauge unit having a piezoresistance effect, formed in the radial direction in said disc-shaped diaphragm;
(c) at least one tangential strain gauge unit having a piezoresistance effect, formed in the tangential direction of said disc-shaped diaphragm;
(d) a supporting base for supporting the outer peripheral

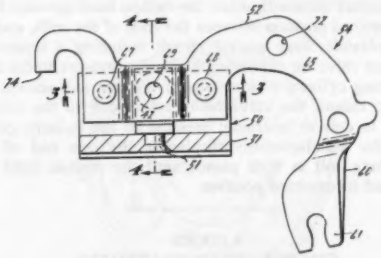
portion of said disc-shaped diaphragm, wherein said radial strain gauge unit is disposed near the peripheral portion of said disc-shaped diaphragm, and said tangential strain gauge unit is disposed in the position near the point where a curve representing the relationship between the non-linearity and the distance from the center of said diaphragm to said tangential strain gauge unit, first intersects the straight line on which the non-linearity is substantially.

4,173,901

BALL JOINT AND POLE ASSEMBLY FOR STARTER MOTOR

James E. Jaseck, Madison Heights, and Alex M. Pentland, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 24, 1978, Ser. No. 927,207
Int. Cl.[2] F02N *11/02*
U.S. Cl. 74—6 **10 Claims**



1. An automobile starter motor having an armature and a housing in which is disposed at least one electric current carrying coil, said coil serving, in response to an initial flow of current through said coil, as a solenoid to selectively pull into a hole in the housing, a pole means coupled to the housing for responding to a magnetic field, the motor further having a starter drive assembly coupled to the armature for rotation therewith and lever means cooperating with the pole for controlling the position of the starter drive assembly axially of the armature, the improvement comprising:
a coupling means for connecting said pole means to said lever means including a ball joint means for providing an adjustable coupling, a post means extending outwardly from said ball joint means so that said pole means can pivot with respect to said lever means and said pole means can adjust to align in abutment with said housing thereby compensating for manufacturing tolerances and reducing flux path reluctance.

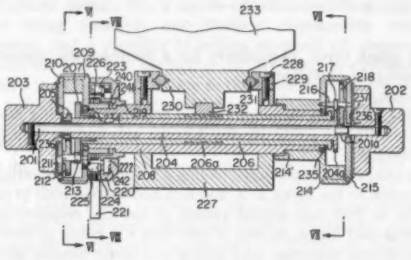
9. A method of operating a starting motor for an automobile wherein the starting motor includes a housing containing an armature and coil, a hole in the housing for receiving a pole piece connected to a lever which is pivotally mounted on the housing for moving a starter drive, said method including the steps of:
energizing the coil with an electric current;
attracting the pole piece to the hole in the housing;
pivoting with three degrees of freedom of movement the pole piece with respect to the lever so that the pole piece has maximum seating on the housing; and
retaining the lever in a pivoted position with the pole piece seated on the housing so that the starter drive is engaged to start the automobile engine.

4,173,902

SINGLE-AXIS COARSE AND FINE ADJUSTMENT DEVICE PROVIDED WITH MEDIUM ADJUSTMENT

Megumu Shio, Kamakura, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Division of Ser. No. 718,452, Aug. 30, 1976, Pat. No. 4,083,256.
This application Oct. 25, 1977, Ser. No. 845,222
Int. Cl.[2] F16H *35/18*; G02B *21/26*
U.S. Cl. 74—10.52 **5 Claims**



1. A single-axis coarse and fine adjustment device for driving a carriage, comprising:
stationary support means;
a pinion shaft rotatably supported by the support means and having a pinion meshing with a rack provided on the carriage;
a connecting shaft rotatably supported within the pinion shaft and having a first toothed portion and a second toothed portion;
first decelerating gear means meshing with the first toothed portion to decelerate the rotation of the connecting shaft and transmit it to the pinion shaft;
a fine adjustment shaft rotatably supported within the connecting shaft and having a toothed portion;
a fine adjustment operating member for rotating the fine adjustment shaft;
second decelerating gear means meshing with the second toothed portion of the connecting shaft and the toothed portion of the fine adjustment shaft to decelerate the rotation of the fine adjustment shaft and transmit it to the connecting shaft;
a medium adjustment operating member rotatably supporting the second decelerating gear means and rotatably supported by the support means so as to impart rotation of equal ratio to the connecting shaft through the second gear means; and
a coarse adjustment operating member rotatably supported by the support means so as to impart rotation of equal ratio to the pinion shaft through the first decelerating gear means;
said pinion shaft has a toothed portion formed on one end thereof, and said first decelerating gear means comprising a first gear rotatably supported by said coarse adjustment operating member and meshing with the first toothed

portion of said connecting shaft, the number of teeth on said first gear being more than that on said first toothed portion, and a second gear integrally formed with said first gear and meshing with the toothed portion of said pinion shaft, the number of teeth of said second gear being less than on the toothed portion of said pinion shaft.

4,173,903

CRANK DRIVE FOR A PHOTOGRAPHIC CAMERA

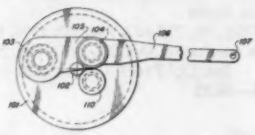
Friedrich Papke, and Erwin Scholz, both of Brunswick, Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Aug. 22, 1977, Ser. No. 826,404

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639953

Int. Cl.[2] F16H *21/18*

U.S. Cl. 74—47 **9 Claims**



1. A crank drive, particularly for a photographic camera, comprising, in combination:

a housing,

a crank, rotatably mounted on said housing and being movable within a circle, having a crank axis and including a crankpin,

a drawbar including a hinge having a hinge axis substantially parallel to the crank axis, and first and second rods pivotable in first and second planes of motion, respectively, about said hinge, an end of said first rod being pivotable about said crankpin, said second rod being slidable along a substantially straight line defined in said housing, said planes being substantially parallel to one another, and

abutment means disposed within said circle, remaining at a predetermined distance from said crank-pin, and projecting into said first plane of motion, whereby said first rod will operatively abut against said abutment means when the drawbar executes a complete stroke along said straight line during a predetermined portion of said stroke, so that said first rod serves as an operative crank, and said hinge serves as an operative crankpin.

4,173,904

APPARATUS FOR AUTOMATICALLY CENTERING AN ENDLESS BAND TRAINED OVER TWO ROLLS

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Continuation-in-part of Ser. No. 714,754, Aug. 16, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,752

Claims priority, application Italy, Sep. 3, 1975, 26875 A/75; Dec. 2, 1975, 29920 A/75

Int. Cl.[2] F16H *7/18;* B65H *25/26*

U.S. Cl. 74—241 **4 Claims**

1. An apparatus for automatically centering an endless band trained over a driven guide roll and a stretching roll, each roll having two ends wherebetween the endless band is centered in a starting position, the rolls having axes defining a plane in the starting position, the band having respective side edges adjacent respective ones of the roll ends, and including a nut-and-spindle mechanism at each end of the stretching roll, the nut of each mechanism being mounted on the roll end and the spindle of each mechanism being in threaded rotatable engagement with the nut but axially stationary whereby rotation of the spindle displaces the end in the plane, the centering apparatus comprising

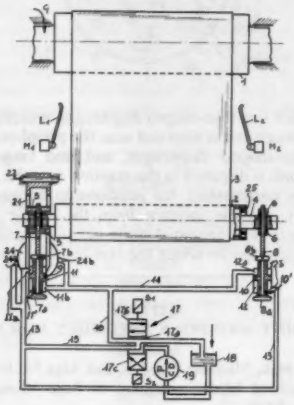
(a) a first hydraulic means for displacing either end of the stretching roll in the plane, the first hydraulic means including

(1) a double-acting cylinder-piston unit at either end of the stretching roll and having a piston connected to a respective one of the spindles,

(b) a second hydraulic means for displacing one of the ends of the stretching roll substantially perpendicularly to the plane, the second hydraulic means including

(1) another double-acting cylinder-piston unit and

(2) a frame pivotally mounted for swinging in a plane substantially perpendicular to the first-named plane, the nut-and-spindle mechanism at the one end being slidably mounted in the frame, and the other cylinder-piston unit being connected to the frame for swinging the frame in the perpendicular plane,



(c) a sensor means disposed adjacent each of the side edges of the endless band and spaced therefrom when the band is centered, a respective one of the sensor means producing a control signal when a respective one of the side edges moves into contact therewith when the endless band deviates from the centered position between the ends of the rolls, and

(d) a hydraulic fluid control circuit including a three-way solenoid valve for delivering hydraulic pressure to the double-acting cylinder-piston units of the first and second hydraulic means, the valve being responsive to the control signal to deliver hydraulic pressure to the cylinder-piston units for simultaneously displacing the one end of the stretching roll in both planes until the endless band has resumed its centered position.

4,173,905

CHANGE-SPEED GEARBOXES

Graham A. B. Byrt, and Douglas E. Riddler, both of Bristol, England, assignors to Masson Scott Thrissell Engineering, Ltd., United Kingdom

Filed Jun. 17, 1977, Ser. No. 807,603

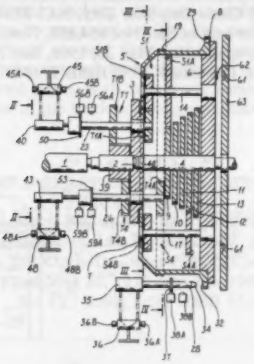
Claims priority, application United Kingdom, Jun. 29, 1976, 27102/76

Int. Cl.[2] F16H *3/08, 3/22;* B23Q *17/00;* B23B *29/24*

U.S. Cl. 74—356 **11 Claims**

1. A change speed gear box comprising an input shaft, an output shaft, a fixed support, a movable support, a plurality of intermediate shafts rotatably carried by said fixed support, a plurality of secondary shafts rotatably carried by said movable support, two gears carried on each of said intermediate and on each of said secondary shafts and rotatable therewith, a common input gear secured to said input shaft and permanently in mesh with one of the gears of each of the intermediate shafts, a plurality of output gears secured to said output shaft with the number of such output gears being equal to the number of secondary shafts, each of said output gears being permanently

in mesh with one of the gears on a different one of the secondary shafts, means for displacing the movable support to bring one of the secondary shafts adjacent to any selected one of the



intermediate shafts to move the second gear on said one intermediate shaft into meshable alignment with the second gear on the selected secondary shaft, and means for subsequently moving one of said aligned second gears into mesh with the other.

4,173,906

PLANETARY GEAR

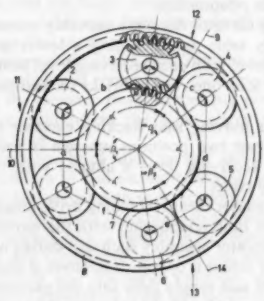
Karlheinz Altenbokum; Klaus Hänsgen, both of Witten, and Heinz M. Hiersig, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,049

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655363

Int. Cl.[2] F16H *57/00, 1/28*

U.S. Cl. 74—410 **8 Claims**



1. Planetary gearset comprising:

a sun gear;

an outer annulus with internal gear;

a planet carrier;

at least one of said gears and said carrier being radially displaceable; and

six planet gears journalled on the carrier and meshing with the sun gear and the outer annulus;

said six planet gears being arranged in groups of two each, wherein the spacings between the gears of and in each of the groups are smaller than the spacings from group-to-group,

the spacings between the respective two gears in each of the groups not being the same for all three groups;

three radial center lines of symmetry respectively for said two planet gears each of said three groups being angularly spaced by 120°.

4,173,907

DEVICE FOR TRANSFORMING A ROTATIONAL MOTION INTO A LINEAR MOTION

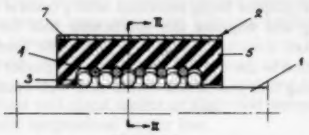
Bengt Lundgren, Ulricehamn, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Aug. 15, 1977, Ser. No. 824,406

Claims priority, application Sweden, Nov. 19, 1976, 7612934

Int. Cl.[2] F16H *25/22*

U.S. Cl. 74—459 **4 Claims**



1. A device for transforming a rotational motion into a linear motion, or reversed, and comprising a shaft having a smooth peripheral surface (1), a sleeve (2) circumscribing said shaft and being rotatably and linearly displaceably arranged thereon, and a plurality of rolling elements (3) disposed between the shaft and the sleeve and arranged in a closed track with a load carrying portion in the shape of a helical line and an unloaded recirculation portion, the sleeve comprising an inner portion (4, 8) of resiliently deformable material with a comparatively hard surface having a helically shaped raceway for the rolling bodies, and an outer portion (5) provided with a recirculation channel (6) for the rolling bodies, said rolling bodies being urged against the smooth peripheral surface of said shaft by the inner resilient portion of the sleeve, the outer portion (5) of said sleeve being made of a resiliently deformable polymer material which contacts the inner portion of the sleeve along the entire length of the load carrying portion of the closed track.

4,173,908

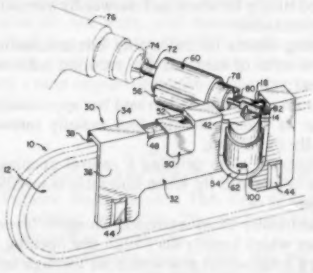
SAW CHAIN SHARPENING FIXTURE

Frank J. Aksamit, West Hartford, Conn., assignor to Pro Sharp Corporation, Newington, Conn.

Filed Jan. 3, 1978, Ser. No. 866,366

Int. Cl.[2] B23D *63/16*

U.S. Cl. 76—25 A **8 Claims**



1. In an assembly for sharpening cutting links of a saw chain having the cutting links mounted on a cutter bar and comprising a sharpening tool and a fixture for the sharpening tool, the improvement wherein the fixture comprises a longitudinally extending frame for straddling the cutter bar and a section of chain mounted on the cutter bar, the frame having an inverted generally U-shaped cross section including a web adapted to freely rest on and be supported by the top of the cutting links

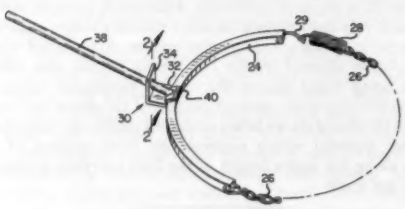
and spaced confronting sidewalls depending from opposite sides of the web and defining an interior channel, said sidewalls being adapted to flex outwardly during mounting of the cutter bar and section of chain in the channel, the frame having intermediate its ends an opening formed in the web and sidewalls for communicating with the interior channel, a pair of adaptor guides respectively mounted on the sidewalls of the frame below its web and diverging outwardly from said opening, the guides being positioned in fixed nonadjusting relationship to said web and sidewalls, each guide having an elongated bearing surface of semi-circular cross section with its lowermost portion below the top of the cutter bar, and an adaptor dimensioned and configured to be seated on and supported by the semi-circular bearing surface of a selected one of the guides, the adaptor being provided with a central aperture for supporting and aligning the sharpening tool for movement along an axis disposed below the web of the frame in spaced apart relation to the bearing surfaces of the guides for sharpening a cutting link positioned within said web opening.

4,173,909

LID LIFTER FOR RECLOSABLE SELF-SEALING BUCKETS

John H. Cleveland, 208 N. Ebbert St., Hillsboro, Oreg. 97123, and Brent A. Bentley, Rte. 4, Box 274, Cornelius, Oreg. 97113

Filed Nov. 30, 1977, Ser. No. 855,945
Int. Cl.[2] B67B *7/00*
U.S. Cl. 81—3.36 **4 Claims**



1. A lifter for non-destructively removing the lid from a container of the type having a radially outwardly facing lip at its upper extremity configured for releasably engaging a radially inwardly facing mating catch on the lid when the lid is urged downwardly over the container, and having paired, spaced-apart outwardly extending flanges located near its upper extremity below the lower most extension of the lid when the lid is installed on the container, said lifter comprising:

(a) an arcuate bar having a width which allows it to be received snugly between said outwardly extending flanges of said container;

(b) fastening means for releasably interconnecting the respective ends of said bar for securing said bar to said container;

(c) a fulcrum plate attached to said bar approximately intermediate its ends and extending radially outwardly and upwardly therefrom;

(d) said fulcrum plate defining a central opening which is slightly below said lip when said lifter is installed on said container;

(e) a cylindrically cross-sectioned, elongate lever having a diameter which loosely fits within said opening, said lever having a longitudinal axis which fits through said opening so that said opening defines a pivot axis about which said lever can be pivoted; and

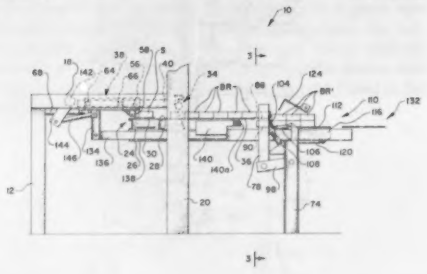
(f) a lifting pad located at the end of said lever, one axis of said lifting pad being acutely angled with respect to the longitudinal axis of said lever so that when said lever is pivoted in said opening, said lifting pad engages said catch and lifts it both outwardly and upwardly to release said catch from engagement with said outwardly facing lip, thereby releasing said lid from said container.

4,173,910

METHOD AND APPARATUS FOR HANDLING BRICK

Cletus E. Lineberry, Rte. 1, Box 106, Staley, N.C. 27355; John G. Buckner, Rte. 2, Box 83, Ramseur, N.C. 27315, and Jimmy W. Harris, 618 Circle Dr., Siler City, N.C. 27344

Continuation-in-part of Ser. No. 854,150, Nov. 23, 1977, abandoned. This application May 30, 1978, Ser. No. 910,646
Int. Cl.[2] B26D *7/06*; B28B *11/14*
U.S. Cl. 83—29 **25 Claims**



14. A brick handling and stacking apparatus comprising:

(a) conveyor means for conveying individual brick slugs to a cutting area;

(b) cutting means associated with said brick handling and stacking apparatus;

(c) a supply table disposed adjacent said cutting means for receiving and supporting individual rows of cut brick after the brick have been moved through said cutting means;

(d) a first pusher means for engaging each brick slug delivered to said cutting area and for pushing the engaged slug towards said cutting means such that successive strokes by said first pusher means results in a series of slugs being pushed through said cutting means for cutting each slug into a series of brick and onto said supply table to form a series of transversely aligned brick rows with each row of brick including a series of individual bricks disposed in side-by-side relationship;

(e) a stacking elevator assembly movably mounted adjacent said supply table and including a lower and an upper receiving level with each receiving level being adapted to receive at least one row of bricks formed on said supply table;

(f) means for moving said stacking elevator assembly between at least two positions wherein in each position a respective receiving level is aligned with the bricks on said supply table;

(g) said first pusher means including drive means for driving the same in time relationship with the movement of said stacking elevator assembly such that during operation said first pusher means is operative to move at least one row of bricks from said supply table into the particularly aligned receiving level of said elevator assembly;

(h) a receiving table disposed adjacent said stacking elevator assembly opposite said supply table for receiving bricks from said elevator assembly;

(i) second pusher means movable between a retracted position and an extended position wherein in moving from said retracted position to said extended position said second pusher means is operative when aligned with a respective receiving level of said stacking elevator assembly to engage the bricks within said receiving level and to push these bricks therefrom onto said receiving table; and

(j) wherein said second pusher means includes drive means for driving the same in timed relationship with said first pusher means and said stacking elevator assembly such that said first and second pusher means are cooperative to simultaneously act to discharge bricks from both said lower and upper receiving levels of said stacking elevator

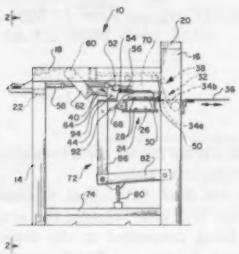
assembly onto said receiving table as during each cycle of said elevator assembly said second pusher means engages bricks in one receiving level and pushes such bricks onto said receiving table while bricks in the other receiving level of said stacking elevator assembly are displaced therefrom by a row of bricks being pushed into that receiving level by said first pusher means, whereby the bricks being pushed from the lower receiving level to form a two course high brick stack during the continuous operation of the brick handling and stacking apparatus.

4,173,911

METHOD AND APPARATUS FOR HACKING AND STACKING BRICK

Cletus E. Lineberry, Rte. 1, Box 106, Staley, N.C. 27355; John G. Buckner, Rte. 2, Box 83, Ramseur, N.C. 27315, and Jimmy W. Harris, 618 Circle Dr., Siler City, N.C. 27344

Filed May 30, 1978, Ser. No. 910,647
Int. Cl.[2] B26D *7/06*; B28B *11/14*
U.S. Cl. 83—29 **11 Claims**



10. A method of receiving and cutting brick slugs and stacking the cut brick slugs in a two course high stack, comprising the steps of:

a. receiving successive brick slugs on an off bearing belt and conveying the received brick slugs to a discharge area such that one or more brick slugs after another are received at said discharge area;

b. pushing one brick slug from one side of said off bearing belt onto a first receiving area;

c. pushing a succeeding brick slug from the other side of said off bearing belt and transferring the same to an elevator;

d. moving the elevator from a receiving position to a discharge position where the same aligns with a second receiving area;

e. transferring the brick slug on said elevator at said discharge position to said second receiving area;

f. returning said elevator to said receiving position;

g. continuing to transfer brick slugs in alternate fashion from said off bearing belt to said first receiving area and said elevator, and continuing to cycle said elevator between said receiving and discharge positions such that brick slugs may be transferred from said elevator to said second receiving area; and

h. cutting the respective brick slugs being advanced on said first and second receiving areas and directing the cut brick being advanced across the uppermost receiving area onto the cut brick being advanced across the lowermost receiving area to form a stack of brick at least two courses high.

4,173,912

FABRIC TRIMMER

Dennis Holp, Fort Wayne, Ind., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 18, 1978, Ser. No. 934,928
Int. Cl.[2] B26D *1/02*; B29H *3/06, 9/04*
U.S. Cl. 83—433 **8 Claims**

1. An edge gum trimmer comprising a support frame adapted to be connected to a calender apparatus which processes a sheet of continuously moving fabric material having parallel strands of cords and with such fabric having a longitudinal center line, said support frame having a pair of parallel guide rods mounted thereon said rods lying in a plane that is normal to said longitudinal center line, adjusting means on said support frame operatively engaging said pair of guide rods for adjusting the inclination of said rods relative to a horizontal

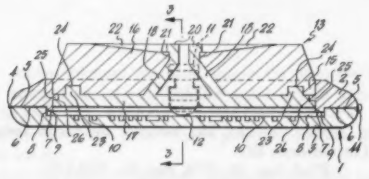
plane, a crosshead slidably mounted on said guide rods, a tool holder, pivot means interconnecting said tool holder and said crosshead, a trimming knife mounted on said tool holder, an adjusting device mounted on said crosshead and operatively connected to said tool holder for pivoting said tool holder and said knife about said pivot means to align said trimming knife relative to said longitudinal center line.

4,173,913

HOLE CUTTER HAVING ROTATABLE BLADE CARRIER

Barrie F. Nicholson, 23 Showell Ln., Lower Penn, Wolverhampton, England

Filed Mar. 8, 1978, Ser. No. 884,386
Claims priority, application United Kingdom, Mar. 8, 1977, 9749/77
Int. Cl.[2] B26D *3/00*
U.S. Cl. 83—555 **10 Claims**



1. A device for cutting a hole in a piece of sheet material comprising a holder for the material, a blade carrier rotatably carried by said holder, a blade carried by said blade carrier, whereby a hole is cut in the material placed in said holder on rotation of said blade carrier, and adjustment means enabling adjustment of the position of said blade relative to the rotational axis of said blade carrier whereby holes of different sizes may be cut, said holder being provided with a hole, and said blade carrier comprising first and second parts overlapping opposite sides of said hole, and releasable securing means connecting said first and second parts, wherein said releasable securing means comprises complementary formations on said parts having a snap engagement with each other to secure said parts together.

4,173,914

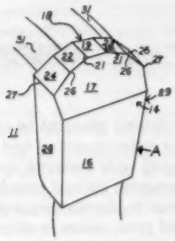
CUTTING TEETH FOR CIRCULAR SAW BLADES

Erwin H. Vollmer, Balmerstrassa, Fed. Rep. of Germany, and George J. Vollmer, Sewickley, Pa., assignors to Vollmer of America Corporation, Pittsburgh, Pa.

Division of Ser. No. 830,673, Sep. 6, 1977, Pat. No. 4,133,240. This application Apr. 24, 1978, Ser. No. 899,534
Int. Cl.[2] B27B *33/08*
U.S. Cl. 83—848 **4 Claims**

1. A raker cutting tooth for use in combination with a low tooth in circular saw blades comprising a leading face and a top, said leading face including a first planar surface and second planar surface extending from said first planar surface to said top and lying in plane inclined at a negative angle from the plane of the first planar surface; and said top consisting of a

first center facet lying in a plane substantially normal to the plane of first planar surface; second and third facets, each positioned adjacent said first facet and lying in a plane angularly offset from the plane of the first facet by a first angle to define first cutting edges; fourth and fifth facets, said fourth facet being positioned adjacent said second facet and said fifth



facet being positioned adjacent said third facet, each of said fourth and fifth facets lying in a plane angularly offset from the plane of the first facet by a second angle to define second cutting edges, said fourth and fifth facets defining third cutting edges with the associated side of said tooth; and each of said sides has a radial clearance angle α.

4,173,915

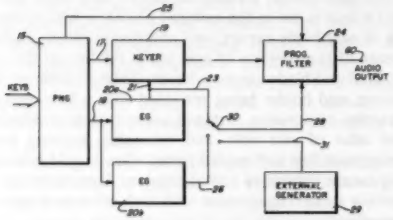
PROGRAMMABLE DYNAMIC FILTER

Glenn M. Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Jun. 29, 1978, Ser. No. 920,277

Int. Cl.[2] G10H *1/02, 5/00*

U.S. Cl. 84—1.19 **9 Claims**



1. In an electronic musical instrument having means for generating tone signals, means for developing a control signal comprising a stream of pulses having a duty cycle determined according to a generated tone signal or a portion of the musical scale containing a generated tone signal and filtering means having a frequency response controlled by the duty cycle of said control signal, the improvement comprising:

first means coupled between said control signal developing means and said filtering means and operable for adjustably varying the pulse width of said pulses for altering the duty cycle of said control signal independently of said tone signal; and

second means for controlling said first means for varying the pulse width of said control signal by a selected amount to achieve a desired filtering means frequency response.

4,173,916

TONE GENERATOR SYSTEM FOR AN ELECTRONIC ORGAN

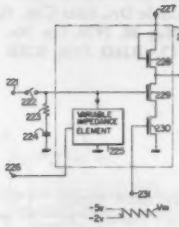
Michihiro Inoue; Takeji Kimura, both of Hirakata; Masaharu Sato, Moriguchi, and Masahiko Tsunoo, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 622,383, Oct. 14, 1975, Pat. No. 4,056,033. This application Aug. 15, 1977, Ser. No. 824,802

Claims priority, application Japan, Oct. 18, 1974, 49-120763; Oct. 18, 1974, 49-120806; Oct. 23, 1974, 49-122663; Nov. 18, 1974, 49-132981; Nov. 19, 1974, 49-133991; Apr. 18, 1975, 50-47740

Int. Cl.[2] G10H *3/00, 1/02*

U.S. Cl. 84—1.09 **7 Claims**



1. An indirect keying circuit for a tone generator system of an electronic organ comprising

first, second and third field effect transistors each having source, drain and gate regions, the source of said first transistor being connected to the drain of said second transistor and the source of said second transistor being connected to the drain of said third transistor,

means connecting the drain of said first transistor and the source of said third transistor to first and second voltage sources respectively,

means connecting the gate of said first transistor to a voltage signal source, means connecting the gate of said second transistor to a third voltage source and means connecting the gate of said third transistor to a musical tone source, the means connecting said third voltage source to the gate of said second transistor comprising a switch associated with a keyboard, and

means connecting the drain of one of said second or third transistors to an output terminal, said switch alternately connecting and disconnecting a D.C. voltage from said third voltage source to the gate of said second transistor thereby controlling the turning on and off of an output analog signal at said output terminal, the amplitude of said output analog voltage being controlled in accordance with the magnitude of the D.C. voltage from said third voltage source.

4,173,917

MUSICAL DRUMS

Clifford A. Della-Porta, Leicester, England, assignor to The Premier Drum Company Limited, Leicester, England

Filed Dec. 20, 1977, Ser. No. 863,866

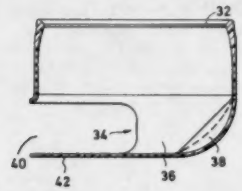
Int. Cl.[2] G10D *13/02, 13/04*

U.S. Cl. 84—419 **4 Claims**

1. A drum shell having a generally cylindrical upper portion and a lower generally bowl-shaped portion, the side wall of said bowl-shaped portion also being generally cylindrical and constituting an integral continuation of said upper portion, the bottom of said bowl-shaped portion being closed,

an aperture in the side wall of said bowl-shaped portion, and an integral sound reflector situated within said bowl-shaped

portion diametrically opposite said aperture, for directing sound toward said aperture, said reflector intersecting



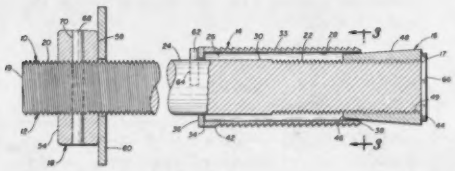
both the side wall and the closed bottom of said bowl-shaped portion.

4,173,918

ROOF BOLT AND THE LIKE

Raymond Piersall, Lake Spa Mobile Home Pk., Star Rte. 1, Box 10, Niland, Calif. 92257

Filed Mar. 27, 1978, Ser. No. 890,260
Int. Cl.[2] F16B *13/06, 31/02*
U.S. Cl. 85—75 **1 Claim**



1. An expansion bolt for use in a predrilled hole of predetermined diameter in rock or like materials, comprising in combination:

(a) an elongated stud of uniform diameter having first and second threaded end portions and an intermediate shank portion, said first end being adapted for insertion into the predrilled hole and the second end remaining outside the hole;

(b) a cylindrical expansion sleeve extending axially around the stud near the first end thereof and covering at least part of the threading on said first end, said sleeve having a uniform inner diameter greater than the outer diameter of the stud for creating an uniform annular radial clearance between the sleeve and stud, and wherein the sleeve has at least four axially extending slots originating at the end of the cylinder nearest the first end of the stud and terminating prior to the opposite end of the cylinder to define an unbroken ring at said opposite end, said slots being symmetrically arranged about the circumference of the sleeve, and the sleeve being formed of spring steel;

(c) a retaining pin carried in a hole formed in the shank portion of the stud and extending radially outwardly therefrom for limiting the movement of said sleeve toward the second end of the stud;

(d) an annular shoulder member carried on the stud between said retaining pin and the expansion sleeve and having an inner diameter closely similar to the outer diameter of the stud;

(e) a frusto conical wedge member threadedly engaged to the first end of said stud and axially aligned therewith, having its narrowest end facing said sleeve and having ribs on the circumferential surface thereof corresponding in number and position to said slots for engaging the slots and holding the sleeve and wedge member in similar rotational position on the stud, the narrow end of the wedge having a radial thickness no greater than said annular radial clearance between the sleeve and stud;

(f) a backing plate attached to the first end of the stud and having a diameter larger than the diameter of the stud and no larger than the maximum diameter of the wedge member;

(g) a threaded nut member engaging the second threaded end portion of the stud, the nut member and stud having an aperture formed diametrically therethrough adapted to be coaxially aligned;

(h) a shear pin carried in the aperture of the nut and passing through the aperture of the stud for maintaining the nut and stud in fixed rotational positions until a predetermined torque is applied to the nut; and

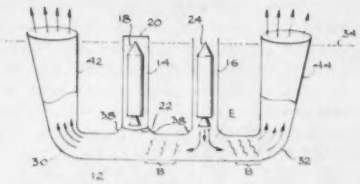
(i) a shoulder plate washer engaging the stud between the nut member and retaining pin and having a larger diameter than the predetermined diameter of the predrilled hole.

4,173,919

TWO-WAY ROCKET PLENUM FOR COMBUSTION SUPPRESSION

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 12, 1977, Ser. No. 860,038
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.8 **12 Claims**



1. A rocket plenum exhaust system for suppressing unwanted combustion of raw exhaust gases within a manifold comprising:

a plurality of rocket launch tubes positioned in line adjacent one another;

a continuous plenum chamber extending generally horizontally along the line of launch tubes and having means for connecting to each of the launch tubes at the base thereof;

means for releasably sealing each launch tube adjacent the base thereof from communication with the plenum chamber, said sealing means being adapted to open upon the firing of a rocket in the associated launch tube to admit exhaust gases from the rocket into the plenum chamber upon said firing and to close for sealing off the launch tube under all other circumstances; and

a pair of upstanding exhaust ducts coupled respectively to opposite ends of the plenum chamber and being sized to correspond approximately in cross-sectional area to the cross-sectional area of the plenum chamber.

4,173,920

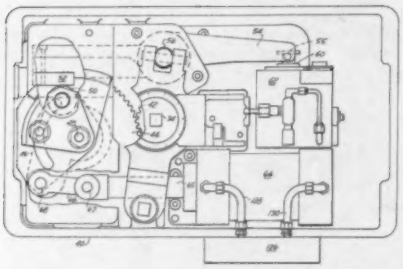
PLUNGE SHAVING MACHINE

John J. Sigman, Jr., Algonac, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jan. 18, 1978, Ser. No. 870,442
Int. Cl.[2] B23F *19/06;* **B23C** *9/00;* **F15B** *15/22*
U.S. Cl. 409—37 **6 Claims**

1. A plunge-cut gear shaving machine in which a gear shaving cutter in the form of a gear-like tool member and a work gear member, are rotated in mesh and relatively fed radially to a predetermined full depth position at a controlled rate, maintained at full depth without lateral traverse for a predetermined dwell period, and then retracted, which comprises a frame, a rotary support on said frame for supporting a first one of said members, a slide on said frame, a second rotary support on said slide for supporting the other of said members in mesh

with said first member, means for driving one of said supports in rotation, a feed device including threadedly engaged screw and nut elements, one of which is rotatable, connected between said frame and said slide to feed said slide upon rotation of said one rotatable element in a direction to cause a radial depth feed between said members, a feed gear fixed to said rotatable feed element, a driving gear in mesh with said feed gear, a piston and cylinder actuator connected to said driving gear, a lever pivoted intermediate its ends on said frame, a cam fixed to said



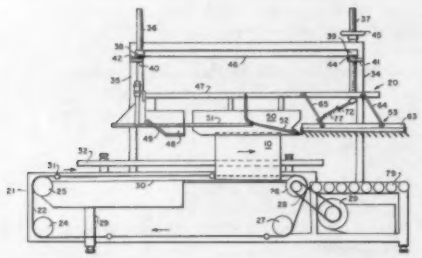
driving gear, a cam follower at one end of said lever engaging said cam, abutment means limiting rotation of said lever and hence of said driving gear, said abutment means comprising a movable abutment engaged by the other end of said lever, and adjustable hydraulic escapement means controlling the rate of movement of said abutment to control the rate of depth feed between said members, said escapement means comprising a manually adjustable metering valve to predetermine the rate of infeed between said members.

4,173,921

CARTON HOLD-DOWN APPARATUS

Halmer B. Mack, Aptos, Calif., assignor to Goodale Manufacturing Company, Inc., Watsonvile, Calif.

Filed Dec. 27, 1977, Ser. No. 864,736
Int. Cl.[2] B31B *1/64*
U.S. Cl. 93—36.3 **5 Claims**



1. An apparatus for exerting pressure on a container comprising in combination:

a conveyor for moving the container along a predetermined path;

a frame positioned above said predetermined path; and

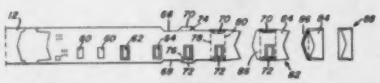
a plurality of flexible planar members supported on said frame and extending downward and across said predetermined path so as to contact a substantial portion of the top surface of the container and exert pressure thereon while flexing as the container is moved along the conveyor.

4,173,922

METHOD FOR MAKING SIDE SEAM ENVELOPES FROM A WEB

Herbert W. Helm, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Continuation of Ser. No. 758,752, Jan. 12, 1977, abandoned, which is a continuation of Ser. No. 569,855, Apr. 21, 1975, abandoned. This application Jan. 5, 1978, Ser. No. 867,328
Int. Cl.[2] B31B *21/00*
U.S. Cl. 93—63 M **4 Claims**



1. In a method for making inside side seam envelopes from a web that includes,

unwinding a web from a reel,

introducing said web into an envelope making machine,

cutting the side edges of said web to form spaced envelope side flaps therein,

forming longitudinal side flap score lines in said spaced envelope side flaps of said web,

folding said envelope side flaps on said web,

cutting envelope blanks from said web with said side flaps folded and forming an envelope blank bottom flap portion,

the improvement comprising:

after said envelope blank is cut from said web applying glue to the upper surface of said folded side flaps of each of said envelope blanks, and

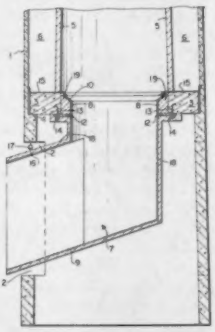
thereafter folding said envelope blank bottom portion into overlying relation with the folded side flaps with glue applied to said envelope blank side flaps to thereby form an inside side seam envelope.

4,173,923

METAL AND BRICK CHIMNEY LINER

Randolph W. Snook, Shawnee Mission, Kans., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 835,900, Sep. 23, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,076
Int. Cl.[2] E04F *17/02*; F23L *17/02*
U.S. Cl. 98—58 **22 Claims**



1. In a chimney having an outer column with an exterior and inner surface, in inner lining spaced therefrom and having a lower end, and breeching means joined to said lining, the improvement comprising:

a breeching member comprising an upright tubular element generally in line with the inner lining, and at least one lateral tubular element, said lateral element extending through the outer chimney column to form a breeching entry;

suspension means coacting with the outer chimney column and the upright tubular element for suspending the breeching member within the chimney at the lower end of the lining, and

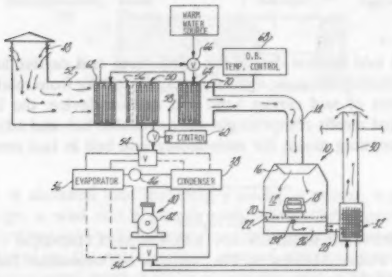
constant loading hanger means for suspending said lateral tubular element from the outer chimney column adjacent the breeching entry.

4,173,924

PAINT SPRAY BOOTH WITH AIR SUPPLY SYSTEM

Norman F. Bradshaw, Surrey, England, assignor to Schweitzer Industrial Corporation, Madison Heights, Mich.

Filed Mar. 1, 1978, Ser. No. 882,345
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 SB **30 Claims**



1. A paint spray booth including an enclosure for carrying out spray painting operations therein and an air supply system, said air supply system comprising:

means directing an incoming air supply into said enclosure;

means exhausting said air after passing through said enclosure;

filtration means filtering said air after passing through said enclosure removing paint overspray solids therefrom prior to being exhausted;

conditioning means for heating or cooling said supply air to a predetermined temperature level to supply said air to said enclosure at said temperature level;

energy recovery means receiving air exhausted from said spray booth enclosure, and including:

means for transferring heat from said supply air to said filtered exhaust air when said conditioning means air cooling is in operation; and

further including means for transferring heat from said filtered exhaust air into said supply air when said conditioning means air heating is in operation;

whereby said system energy efficiency is increased by said heat transfer.

4,173,925

VARIABLE TILT ROTATING POT COOKER AND MIXER

Joseph L. Leon, 154-01 Barclay Ave., Flushing, N.Y. 11355

Continuation of Ser. No. 799,442, May 23, 1977, abandoned. This application May 16, 1978, Ser. No. 906,648
Int. Cl.[2] A47J *27/00*; B01F *9/02*
U.S. Cl. 99—348 **21 Claims**

1. A variable tilt, rotating pot for cooking and mixing a plurality of foods or substances, comprising

a base,

a shell pivotably mounted on said base and movable between horizontal and vertical positions,

a pot rotatably mounted in said shell and adapted for mixing and tumbling said foods or substances,

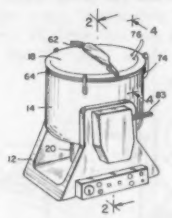
means, coupled to said pot and mounted on said shell, for rotating said pot in said shell,

cover means adapted for disposal over said pot in sealing engagement therewith,

bracket means, mounted on said shell, for securing said cover means to said pot in a fixed position relative to said pot and said shell,

bearing means, mounted on said cover means and adapted for disposal between said cover means and said pot in engagement with said pot, for permitting rotation of said pot relative to said cover,

means for holding said shell and said pot in a tilted position during rotation of said pot, and



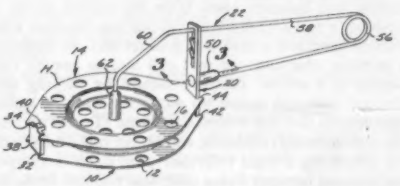
vent means, disposed in said cover means and adapted to communicate with the interior of said pot, said vent means being located vertically above a horizontal diameter of said pot adjacent a vertically uppermost edge of said cover means for permitting the release of pressure from said pot.

4,173,926

TORTILLA PIE SHELL HOLDER

Clifford N. Brignall, P.O. Box 391, Boulder City, Nev. 89005

Filed Nov. 3, 1978, Ser. No. 957,325
Int. Cl.[2] A47J *36/20*
U.S. Cl. 99—349 **6 Claims**



1. A holder for forming a tortilla or the like into a pie shell and then cooking said tortilla in hot oil, said holder comprising:

a lower apertured pan;

an upper apertured pan similar in shape to said lower pan and movable downwardly within the confines of said lower pan, with the space between said lower and upper pans receiving an uncooked tortilla when said pans are vertically separated;

guide means interposed between said pans to restrain their relative horizontal movement while permitting their relative vertical movement;

an upstanding bracket secured to said lower pan; a handle attached to said bracket, said handle having its inner end secured to said upper pan; and lock means interposed between said bracket and said handle to selectively control the vertical position of said upper pan relative to said lower pan, whereby said holder and the uncooked tortilla therein may be lowered into said oil to render said tortilla pliable, whereafter said upper pan is lowered toward said lower pan to deform said tortilla into a pie shell shape until said tortilla is cooked.

4,173,927

PRINTING DEVICE

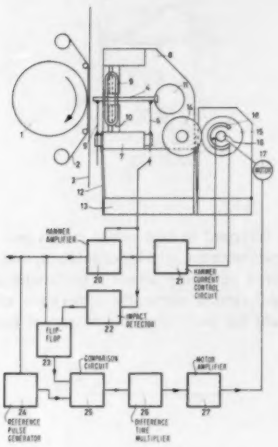
Dick Van Kempen, Eindhoven, and Marius Quirijnen, Zoetermeer, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 780,962, Mar. 24, 1977, abandoned. This application Aug. 22, 1978, Ser. No. 935,895

Claims priority, application Netherlands, Apr. 1, 1976, 7603373

Int. Cl.[2] B41J *7/92*

U.S. Cl. 101—93.03 **3 Claims**



1. A printing device for printing images on an associated record carrier having at least one layer which comprises: a roll on which a plurality of printing characters are disposed, at least one printing hammer, means mounting said roll for relative motion with respect to said one printing hammer, means for holding the record carrier proximate to said roll, means biasing said hammer away from the record carrier to a first position, a coil cooperating with said one hammer which when excited generates a field which urges said one hammer toward a printing character on said roll and to impact said record carrier in a second position, means for varying the current through said coil, means for mounting said one hammer to be movable so that the distance between (1) said one hammer in the non-actuated condition, and (2) the roll is adjustable, means for providing a fixed reference time signal corresponding to the nominal hammer flying time, said nominal flying time being the time from said first position to said second position with said record carrier having a given number of layers and which produces images in the desired location which are legible, means for measuring actual flying time of said one hammer, means for comparing actual flying time of said one hammer with said fixed reference signal and, means for displacing said one hammer relative to said roll and changing the impact force responsive to a difference between said signal corresponding to nominal hammer flying time and actual flying time for said one hammer.

4,173,928

SCREEN PRINTING MACHINE

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

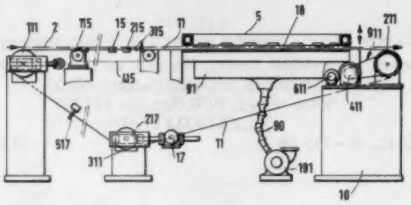
Filed Sep. 22, 1977, Ser. No. 835,793

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643226

Int. Cl.[2] B05C *17/06*

U.S. Cl. 101—126 **16 Claims**

1. A screen printing machine, comprising a printing station including a printing screen; means for supporting and transporting a sheet-material workpiece to be printed, including an endless gas-permeable carrier band having a workpiece supporting run extending beneath said printing screen; suction means below said supporting run for drawing printing ink into the workpiece on said supporting run, including a suction device and means for moving said suction device to and fro below said printing run; and means between said supporting



run and said suction device for reinforcing said carrier band and protecting the same against damage resulting from relative movement of said carrier band and suction device, the last-mentioned means comprising a gas-permeable belt and adjustable tensioning means for maintaining said belt in taut condition.

4,173,929

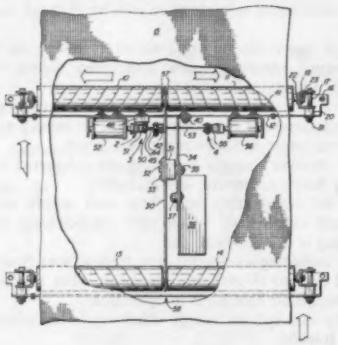
PRINTER RIBBON ANTI-FOLD MECHANISM

Gary P. Fisher, Melbourne, Fla., assignor to Documation Incorporated, Melbourne, Fla.

Filed Nov. 29, 1977, Ser. No. 855,767

Int. Cl.[2] B41J *35/08*

U.S. Cl. 101—336 **17 Claims**



1. A printer ribbon anti-fold mechanism comprising in combination:

support frame means;

a plurality of elongated ribbon support rollers, each roller having serrations thereon, and each roller mounted with one end abutting one end of at least one other roller of said plurality of rollers, said abutting rollers being mounted at an angle to the elongated center axis of each other roller, whereby a printer ribbon is directed away from the abutting ends of said abutting rollers to prevent creasing of the ribbon;

linkage means connected to said frame means and to one end of each said elongated roller for shifting the angular position of said abutting rollers between a first position, when siad ribbon is moving in one direction, and a second position when said ribbon is moving in a second direction, whereby said printer ribbon is directed away from the abutting ends of said rollers in either direction of travel of said rollers; and

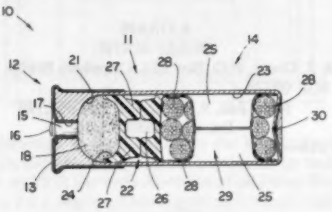
actuation means connected to said linkage means for actuating said linkage means and rollers between said roller's first and second position upon a change in direction of said ribbon mounted thereover.

4,173,930

DIMPLED SHOTGUN PELLETS

C. Dickson Faires, Jr., 7621 Somerset Bay, Apt. B, Indianapolis, Ind. 46240

Filed Oct. 25, 1977, Ser. No. 844,880
Int. Cl.[2] F42B *7/02*
U.S. Cl. 102—42 R 8 Claims



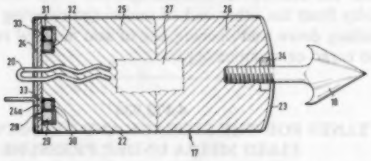
1. A shotshell load including a casing, a primer, a powder charge, a wad and a plurality of pellets, the improvement comprising said pellets having a plurality of concave dimples arranged on the outer surfaces thereof, the concave dimples being arranged symmetrically around the outer surfaces of said pellets.

4,173,931

INCENDIARY WARHEAD

Alois Schiessl, Marzoll, Fed. Rep. of Germany; Georg Prachauser, Oberalm, Austria; Wolfgang Badura, Turek-Marzoll, and Wolfgang Trede, Weil am Rhein, both of Fed. Rep. of Germany, assignors to Firma BUCK Chemisch-Technische Werke GmbH. & Co., Bad Ueberkingen, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,599
Int. Cl.[2] F42B *13/44*
U.S. Cl. 102—90 13 Claims



1. In a warhead of the type comprising a body and incendiary units which are stacked within said body and which are ignited and ejected from the body by a bursting charge, to be spread over a target area, the improvement wherein said incendiary units each comprise:

a cup-shaped housing;

a cover closing a top end of said housing;

a three-part incendiary filling compressed within said housing, said filling comprising

a flame substance which forms a flame during an extended period of combustion,

a thermit substance which forms a red-hot slag during a shorter period of combustion, and

a transfer substance disposed between and completely enveloped by said flame substance and said thermit substance, said transfer substance being readily ignitable by said flame substance and adapted to burn with considerable heat and ignite said thermit substance;

an anchoring point projecting from a bottom end of said housing; and

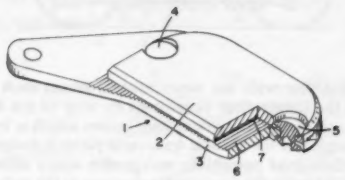
a tail unit connected at said top end of said housing for regulating the discent of the housing.

4,173,932

SAFETY SHUTTER FOR A FUZE

Yvanhoe Matte, and G. Russel Walker, both of Quebec, Canada, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 15, 1969, Ser. No. 846,297
Int. Cl.[2] E42C *15/34*
U.S. Cl. 102—254 7 Claims



1. In a munition having a main explosive charge, a detonating charge for exploding said main charge, and a safety shutter between said charges for minimizing the risk of inadvertent explosion of said main charge, said safety shutter being movable from a "safe" to an "armed" position,

the improvement comprising, in combination therewith, a pair of thin metal shutter plates fastened together in contact with each other by fastening means passing through aligned holes in said plates, one of said plates being near said detonating charge and the other plate being near said main charge when said safety shutter is in the "safe" position,

each of said plates having a plurality of parallel grooves in only one of its faces, said grooves of said first plate facing the grooves of said other plate and running in a direction perpendicular to the direction of the grooves in said other plate to provide substantially only point contacts between said plates;

the other surface of each of said plates being substantially smooth;

one of said plates being larger than the other plate, said larger plate being the arm of said movable shutter, and said larger plate being ungrooved in the area not in contact with said other plate;

whereby upon accidental explosion of said detonating charge when said safety shutter is in the "safe" position, the shock wave energy of said detonating charge is absorbed by crushing deformation and shearing of said grooved plates without spalling of the plate near said main charge, and the detonation of said main charge is thereby prevented.

4,173,933

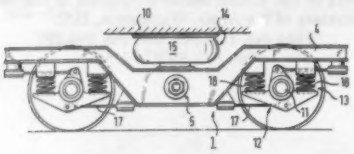
HIGH SPEED BOGIE

Ulrich Kayserling, Nüremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nüremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 575,640, May 8, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,940
Claims priority, application Fed. Rep. of Germany, May 8, 1974, 2422226
Int. Cl.[2] B61F *5/10, 5/16, 5/24, 5/52*
U.S. Cl. 105—182 R 15 Claims

1. A bogie with pivoting frame members for high-speed rail vehicles formed by two rigid bogie longitudinal beams having lateral extensions which are pivotal in vertical direction relative to each other though in the horizontal plane being rigid

and firm relative to each other, in which said longitudinal beams are interconnected by elastic wear-resistant means which are arranged symmetrically to and in the region of the vertical central transverse plane of the bogie, and in which said bogie has at least one pivot point for the pivoting frame members with the upper structure of the rail vehicle and with each axle bearing having axle bearing guiding means, the improvement in combination therewith comprising a wear-resistant means interconnecting the central areas of the bogie longitudi-



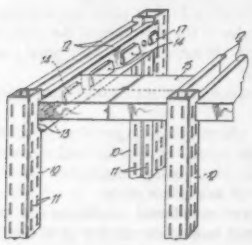
nal beams together with one wear-resistant means each interconnecting the longitudinal beam ends by way of the lateral extensions, and that said wear-resistant means which is located within the region of the vertical transverse plane is designed as an intermediate joint permitting movements solely about the vertical axis whereas the wear-resistant means at the ends form components of horizontal spring leaves which form the lateral extensions of the bogie, the ends of said spring leaves being connected to the rigid lateral extensions arranged at the ends of said longitudinal means.

4,173,934

SHELVING STRUCTURE

Dennis deB. Searby, Burlington, Canada, assignor to Speedshelf International, Inc., Skokie, Ill.

Filed Sep. 8, 1977, Ser. No. 831,524
Claims priority, application Canada, Sep. 24, 1976, 262040
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—111 **25 Claims**



1. In a vertical framework shelving structure extendable in both lateral and longitudinal directions including, in combination:

at least four vertical columns, each column being a tubular member having a rectangular cross-section thereby forming four vertical faces consisting of a front face, a back face and a pair of side faces, each side face being provided with a series of pairs of spaced mounting slots, the mounting slots being both horizontally and vertically aligned;

at least two lateral bracing members extending horizontally between and connected to a pair of front and rear vertical columns and at least two additional lateral bracing members extending horizontally between and connected to a second pair of front and rear vertical columns, each end of said lateral bracing members being formed with at least two mounting lugs projecting at right angles to the plane of the bracing member, arranged in vertical alignment with and spaced apart vertically a distance equal to the vertical spacing of the mounting slots on the vertical columns, at least one mounting lug having a locking means at the lower portion thereof and each of said lateral bracing members having at a side surface thereof at least one upwardly extending shelf support flange, and

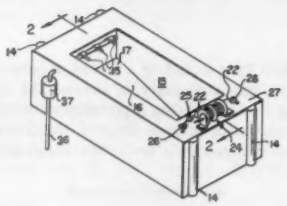
at least one rectangular horizontal shelf member made of sheet metal and extending longitudinally between one lateral bracing member and the next horizontally disposed lateral bracing member thereby defining a shelf structure, said rectangular horizontal shelf member having a downwardly extending lateral and longitudinal periphery, the longitudinally opposite ends of said rectangular horizontal shelf member being adapted to engage with the upwardly extending shelf support flanges of the horizontal lateral bracing members.

4,173,935

DUMP SCOW

Frederick J. Grace, P.O. Box 516, Chambers Bridge Rd., Bricktown, N.J. 08723

Filed Jan. 9, 1978, Ser. No. 867,720
Int. Cl.[2] B63B *35/30*
U.S. Cl. 114—36 **3 Claims**



1. A dump scow comprising a hull having a single cargo carrying cavity, flotation compartments disposed in said hull surrounding said cargo carrying cavity, a single discharge opening in the bottom of said hull at one end of said cargo carrying cavity, said cargo carrying cavity having a bottom surface downwardly sloping from the other end of said cargo carrying cavity to said cargo discharge opening, a gate having a hinge, said gate normally closing said cargo discharge opening, means for controllably closing said gate and for controllably opening said gate for unloading material contained in said cargo carrying cavity through said discharge opening, and water-fed nozzles for introducing wash water into said cargo cavity from the other end of said cargo carrying cavity, for washing down said opening any of said material remaining in said cargo carrying cavity.

4,173,936

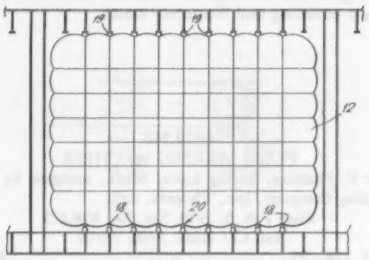
TANKS FOR THE STORAGE AND TRANSPORT OF FLUID MEDIA UNDER PRESSURE

Herbert C. Secord, Markyate, England, and Alfred H. Schwendtner, New York, N.Y., assignors to Martacto Naviera S.A., Washington, D.C.

Filed Sep. 1, 1977, Ser. No. 829,915
Claims priority, application United Kingdom, Sep. 8, 1976, 37247/76
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **9 Claims**

1. A support system for a tank of which at least the bottom wall is made up of a series of outwardly convex lobes that are elongated in one horizontal direction so as to form a series of parallel interlobe nodal recesses between the lobes, said support system comprising a plurality of support assemblies under the tank, each support assembly consisting of a pedestal upstanding from external support structure below the tank, and a block of load-bearing heat-insulating material supported on said pedestal and tapering upwardly to an apex at its top which is shaped to fit contiguously into an interlobe nodal recess of the tank bottom, said pedestal having at its bottom a base

secured to said external support structure and further having at its top a tray-like saddle with a horizontal floor in which the bottom of said block rests, with synthetic plastics material filling said saddle tray and in which said bottom of said block is embedded, the width of said bottom of said block, in the



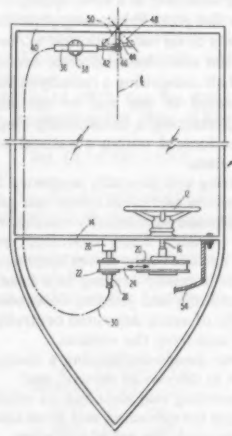
horizontal direction at right angles to the longitudinal direction of said parallel lobes forming the bottom of the tank, being less than the width in the same direction of said tray-like saddle so as to allow for a degree of misalignment between said pedestal and the interlobe recess of the tank bottom.

4,173,937

REMOTELY ACTUATED MARINE STEERING SYSTEM

Walter Kulischenko, East Brunswick, N.J., and Martin J. Capdevielle, Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 23, 1978, Ser. No. 880,410
Int. Cl.[2] B63H *25/00*
U.S. Cl. 114—144 R **3 Claims**



1. In a marine vessel steering system wherein manually-operable steering control means effects rotation of rotatable flexible means for controlling movement of a steering member through screw means which converts rotary motion from said rotatable flexible means to linear motion, said linear motion effecting movement of said steering member which controls direction of travel of said marine vessel, the combination therewith of the improvement characterized by an absence of gear means between said manually-operable steering control means and said rotatable flexible means, said improvement comprising

a driver pulley rotating in response to and accordance with rotation of said manually-operable steering control means,

a driven pulley,

belt means operably engaged about said driver pulley and said driven pulley whereby a single revolution of said manually-operable steering control means and driver pulley causes a plurality of revolutions of said driven pulley,

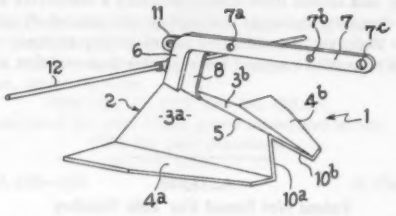
said rotatable flexible means having one end thereof connected to an output of said driven pulley for rotation therewith and other end of said rotatable flexible means connected to said screw means.

4,173,938

ANCHORS AND ANCHORING SYSTEM

Armand T. Colin, Versailles, France, assignor to Constructions Metalliques de Provence, France

Filed Sep. 28, 1977, Ser. No. 837,407
Claims priority, application France, Oct. 6, 1976, 76 30135
Int. Cl.[2] B63B *21/34*
U.S. Cl. 114—301 **21 Claims**



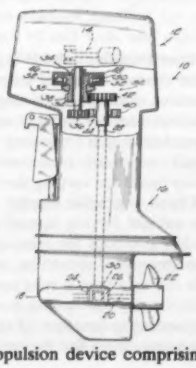
1. An anchor for positioning on water floating machines, such as drilling platforms, drags, landing stages, river crossing structures, said anchor being intended to be lowered to a position flat on the water bed and comprising a plough and a shank which is rigid with the plough, the plough having substantially a dihedral shape and comprising lateral substantially planar side walls defining therebetween an upper corner edge defined by the dihedral angle and having longitudinal edges which are substantially contained in a common plane perpendicular to a bisecting plane of the dihedral angle, the corner edge being downwardly inclined toward said common plane from an end of the corner edge in the vicinity of which end the shank is rigidly fixed to the plough, the anchor having a substantially constant wall thickness in the plough part thereof.

4,173,939

TWO-SPEED TRANSMISSION

Charles D. Strang, Lake Forest, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 729,379, Oct. 4, 1976, abandoned. This application Feb. 22, 1978, Ser. No. 880,038
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—17 **20 Claims**

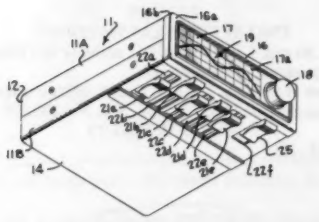


16. A marine propulsion device comprising an input shaft

drivingly connected to a power source, a lower unit having a rotatably mounted drive shaft, a propeller shaft rotatably mounted in said lower unit and carrying a propeller, means drivingly connecting said drive shaft to said propeller shaft, and a two-speed transmission drivingly connecting said input shaft to said drive shaft and including first drive means between said input shaft and said drive shaft for selectively drivingly connecting said input shaft and said drive shaft at all input speeds and including a drive gear, a driven gear in meshing engagement with said drive gear, and a one-way overrunning clutch drivingly connecting said input shaft and said drive shaft through said drive and driven gears when the rotational speed of said input shaft is less than a predetermined value, said first drive means having an input-output speed ratio with a first value, and second drive means for selectively drivingly connecting said input shaft and said drive shaft when the rotational speed of said input shaft is greater than said predetermined value, said second drive means including a selectively actuatable clutch for drivingly connecting said input shaft and said drive shaft, said second drive means having an input-output speed ratio with a second value greater than said first value.

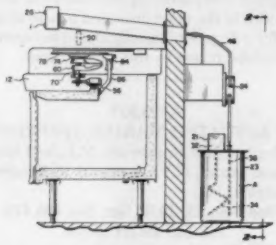
4,173,940
Patent Not Issued For This Number

4,173,941
RESPONSE TRACER AUDIO EQUALIZER AMPLIFIER UNIT HAVING GRAPHIC RESPONSE DISPLAY
John F. Castagna, Brooklyn, N.Y., assignor to Sparkomatic Corporation, Milford, Pa.
Filed Jun. 8, 1978, Ser. No. 914,064
Int. Cl.[2] H03G *1/00*
U.S. Cl. 116—307 **11 Claims**



1. A response tracer amplifier unit having graphic display of frequency response characteristics of output signals from an audio frequency source, comprising an amplifier cabinet housing audio amplifier circuitry for variably amplifying the audio signals at plural predetermined frequency bands in the audio spectrum, a manually adjustable tone control for each of the respective frequency bands for varying the signal amplification at each associated band, a graphic display window panel in a front wall of the cabinet having laterally spaced markings identifying graph-like positions for selected frequencies over most of the audio frequency spectrum, means supporting a continuous flexible curve indicator wire transversely spanning a face of said window panel for vertical movement of portions of the wire corresponding to locations of said frequency bands in a frequency response curve for the amplifier, and flexible motion translating means between each of said adjustable tone controls and said portions of the curve indicator wire for moving said portions of the wire vertically up and down responsive to manual adjustment of the tone controls for the associated frequency bands in a manner to shape the wire to indicate generally a frequency response curve for the audio spectrum including said frequency bands.

4,173,942
PIZZA MAKING MACHINE
Robert F. Plattner, Spring Lake, Mich., assignor to Bastian Blessing Company, Inc., Phoenix, Ariz.
Filed Feb. 9, 1978, Ser. No. 876,271
Int. Cl.[2] B05C *5/00, 13/02*
U.S. Cl. 118—25 **6 Claims**

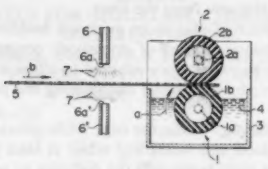


1. In a pizza making machine,
a vertical shaft rotatable at a slow speed,
a substantially flat pizza supporting plate disposed substantially coaxially at its base with said vertical shaft,
a fitting between said shaft and plate carried on the upper end of the shaft comprising a radially extending lower arm member secured at one end to the shaft for rotation thereby and carrying a horizontally disposed off center pivot means located within a vertical projection of the supporting plate,
a plate supporting arm pivotally supported for limited vertical movement on said pivot means and carrying a bearing assembly disposed substantially coaxial with said vertical shaft for a variable tilting movement progressing rotatively with respect to the lower member,
resilient means normally holding said bearing with its axis disposed vertically and yielding downwardly under additional weight of sauce deposited centrally on the plate to incline said axis from the vertical,
peristaltic pump means discharging a charge of pizza sauce on the plate at the center thereof, and
means for supporting said plate against rotation to provide a wobble action for spreading said pizza sauce thereon from the center towards the peripheral edge.

4,173,943
DEVICE FOR MOISTENING BLOOD SERUM BEARING FILM IN ELECTROPHORETIC APPARATUS
Toshihide Fujiwara, Fuchu; Nobutaka Kaneko, and Ryo Fujimori, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed May 2, 1978, Ser. No. 902,047
Claims priority, application Japan, May 17, 1977, 52-56840
Int. Cl.[2] G01N *31/08, 33/16*
U.S. Cl. 118—718 **7 Claims**

1. A device for wetting a blood serum bearing film in elec-

trophoretic apparatus, comprising a first roller having a surface layer formed of a sponge material and disposed so that the surface layer is partly maintained in immersion in a buffering solution, a second roller disposed above and in abutting relationship with the first roller, wetting means for passing a blood



serum bearing film between the rollers to wet the film with the buffer solution that is contained in the surface layer while the film passes between the rollers, and a vapor ejection tube disposed forwardly of the rollers for moistening the film by the application of a vapor thereto before the film is wetted.

4,173,944

SILVERPLATED VAPOR DEPOSITION CHAMBER

Franz Köppl, Altötting; Helmut Hamster, Burghausen; Rudolf Griesshammer, Burghausen, and Helmut Lorenz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

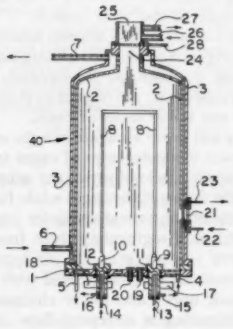
Filed Feb. 14, 1978, Ser. No. 878,127

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722778

Int. Cl.[2] **C23C** *13/08*

U.S. Cl. 118—719 **2 Claims**

1. In a device for the deposition of pure semiconductor materials, especially silicon, by thermal decomposition of gaseous compounds of said semiconductor materials on carrier bodies heated to decomposition temperature, wherein the device consists of a metallic base plate; mounting means and electrical connections thereon for heating the carrier bodies;



pipe connections for supply and exhaust of said gaseous compounds; a first bell-shaped cover forming a gas-tight seal with said base plate and defining a reaction chamber therewith; the interior surfaces of said chamber being fabricated of either silver or silver plated steel; a steel bell-shaped cover spaced from said first cover and forming a closed annular chamber therewith; cooling means provided for said annular chamber: an opening formed at the apex of said covers; removable closure means disposed at said apex opening for sealing said reaction chamber; and a finger shaped heater means alternately disposed within said chamber and sealing said opening when said closure is removed.

4,173,945

ELECTROSTATIC PRINTING MACHINE WITH IMPROVED WEB-DEVELOPING SYSTEM

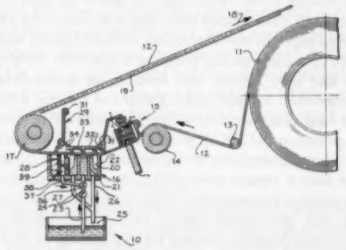
Keith E. McFarland, Woodside, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1975, Ser. No. 553,591

The portion of the term of this patent subsequent to Nov. 13, 1994, has been disclaimed.

Int. Cl.[2] **G03G** *13/10*

U.S. Cl. 118—660 **10 Claims**



1. In an electrostatic printing machine having development apparatus of the type in which fluid toner material is applied to the surface of a web to develop latent electrostatic images thereon, said development apparatus including a toner fountain and a pump for pumping toner into the fountain from a body of toner, and a vacuum channel member for removing excess toner from the surface of said web, said channel member extending transversely of the path of movement of said web and being formed with a cavity open at one side and surrounded by walls which terminate in substantially a common plane for engaging said web passing thereacross to substantially seal the open side of the cavity and having a flow passage formed to conduct fluid toner out of said cavity, the improvement comprising,

aspirator means to provide a degree of suction in proportion to the discharge pumping rate of said pump,

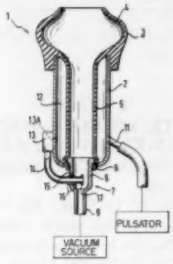
means operatively coupling said aspirator means in fluid communicaton with the discharge side of said pump for generating said degree of suction, and

means operatively coupling said degree of suction in fluid communication with said vacuum channel flow passage for withdrawing toner from within said cavity.

4,173,946
MILKING CUP

Jakob Maier, Türkheim, Fed. Rep. of Germany, and Tilman Hoefelmayr, Zürich, Switzerland, assignors to Kunzler & Co., Berneck, Switzerland

Continuation of Ser. No. 689,123, May 24, 1976, abandoned.
This application Sep. 25, 1978, Ser. No. 945,499
Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523465
Int. Cl.[2] A01J 5/04
U.S. Cl. 119—14.36 6 Claims



1. In a milking cup for use with a vacuum source and a pulsator, comprising a rigid cup sleeve, a resiliently flexible rubber teat holder received in said cup sleeve, said rubber teat holder having a teat receiving end and a suction sleeve means connected in fluid circuit with said teat receiving end and milk discharge pipe means connected in fluid circuit with said suction sleeve means, means defining a chamber between said cup sleeve and said rubber teat holder, an under-pressure relief valve mounted on said milking cup and having a fluid connection to said chamber and a characteristic of responding to an under-pressure reduction in said chamber during a relief cycle in a milking operation to facilitate the flow of air into said suction sleeve means, a conduit connected in fluid circuit with and extending between the interior of said milk discharge pipe means and said relief valve, the improvement comprising wherein said conduit extends on the outside of said cup sleeve between said relief valve means and said milk discharge pipe means and has a terminal end which is spaced inwardly of the inner sidewall of said milk discharge pipe means, said terminal end having a radially enlarged flange thereon defining a drip nose having surface means causing milk from a milking operation to collect on said enlarged flange and be prevented from entering said conduit during operative and inoperative time intervals.

4,173,947
METHOD AND APPARATUS FOR REARING PIGS IN CAGES

John V. Whiteside, Jr., Nesmith, S.C., assignor to John G. Wellman, Johnsonville, S.C.

Filed Jun. 13, 1977, Ser. No. 805,637
Int. Cl.[2] A01K 1/00, 1/02
U.S. Cl. 119—18 41 Claims

1. A method of rearing hogs to increase the frequency of litters from each sow while enhancing the condition of the sow and reducing the mortality rate in each litter, said method comprising

placing each pregnant sow prior to delivery of a litter in a confining farrow crate having sufficient room for the sow to move forwardly and backwardly therein and to lie down but insufficient room to turn around,

maintaining the sow in the farrow crate after the birth of a litter for a period of time no longer than about three weeks while suckling the litter and, while during at least the last half of the period of time, providing supplemental food accessible to the litter but inaccessibly located to the sow,

removing the sow and the litter from the farrow crate and separating the sow from the litter,

placing the litter of pigs in an enclosed building within at least one elevated cage of openwork construction also having an openwork floor adapted to allow animal waste to pass therethrough while maintaining the pigs in a dry condition,

maintaining the pigs within the cage while providing readily accessible food and water and while at least periodically introducing outside air into the building to replenish the oxygen supply therein and to remove odors,

collecting the animal waste passing through the openwork floor of the cage in a trough positioned immediately below the cage,

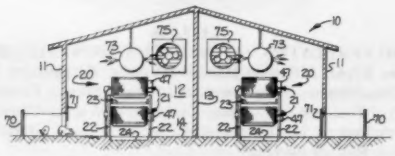
periodically passing a sweeping flow of water along the trough to flush away the animal waste from below the cage, and

directing the animal waste and flush water to a collecting area outside the building.

15. Apparatus for rearing animals in cages, and being especially suited for rearing pigs, said apparatus comprising

an elongate confinement building,

a plurality of elongate cages arranged end-to-end in tiered relation to form respective upper and lower elongate



series of cages extending longitudinally within said confinement building,

each cage comprising a floor of open mesh construction to allow animal waste to pass therethrough while maintaining the animals in a dry condition, and an open-bottomed open mesh enclosure restingly positioned on and supported by said floor with the floor thus serving as the bottom of the cage, said enclosure including a skeletal reinforcing frame and open mesh wire secured to the skeletal frame to define the top and sides of the enclosure, the wire being positioned exteriorly of the frame to locate any rough edges of the wire outside of the cage and shielded from contact by the animals housed therein,

a plurality of upright cage supports at longitudinally spaced locations along the elongate confinement building and engaging and supporting the respective floors of the cages in said upper and lower series of cages,

respective upper and lower elongate troughs underlying said upper and lower elongate series of cages and being positioned for receiving and collecting the animal waste passing through the floors of the cages while facilitating periodic inspection of the animal waste for locating any unhealthy animals and segregating them from the healthy animals,

water supply means operably associated with a corresponding end of said upper and lower elongate troughs for periodically directing a sweeping flow of wash water along the troughs to flush away the animal waste from below the cages,

means associated with corresponding opposite ends of said upper and lower elongate troughs for receiving the wash

water and waste flushed from the troughs and for directing the same out of the confinement building, and

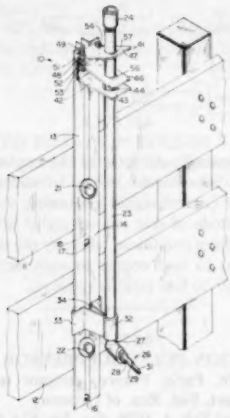
ventilation means provided in said confinement building for at least periodically introducing outside air into the building to replenish the oxygen supply therein and control the temperature in the building.

4,173,948

APPARATUS FOR ADJUSTABLY HOLDING A HOG WATERING DEVICE

Charles D. Austin, Box 280, R.R. 2, Nebraska City, Nebr. 68410

Filed Oct. 17, 1977, Ser. No. 842,632
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—72 **2 Claims**



1. An improved apparatus for adjustably holding a hog watering device in which a nipple valve is affixed to the end of an elongated pipe in fluid communication, wherein the improvement comprises:

(a) an elongated base adapted to be secured to a support comprising a first and second angle irons affixed to each other so as to substantially form a T with the common legs of the angle irons spaced apart to form a slot along the length thereof;

(b) a manually slidable pipe bracket secured with said pipe which includes two arms wherein the ends of said arms are angularly disposed so as to engage the longitudinal edges of said first and second angle irons;

(c) a frictional locking means comprising a first and second plates pivotally mounted to one end of said elongated base wherein the first and second plates are biased angularly and disposed so as to extend divergingly away therefrom and a third plate perpendicularly disposed and secured to said elongated base, said three plates each having a hole, in alignment whereby said first and second plates are pressed together to permit passage and selective adjustment of said pipe extending therethrough.

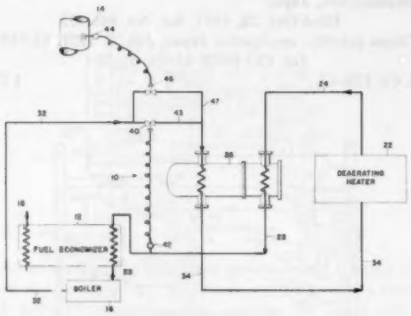
4,173,949

FEEDWATER PREHEAT CORROSION CONTROL SYSTEM

Lester A. Roethe, Tulsa, Okla., assignor to Tranter, Inc., Tulsa, Okla.

Filed Jan. 23, 1978, Ser. No. 871,212
Int. Cl.[2] F22D *1/02*
U.S. Cl. 122—1 C **2 Claims**

1. In a boiler system which includes a boiler for boiling feedwater therein to produce steam, an exhaust stack connected to said boiler for removing flue gas therefrom, and a fuel economizer mounted in said stack for preheating feedwater in said economizer prior to introduction of said feedwater into said boiler, and wherein said fuel economizer preheats the feedwater therein by passing the feedwater in heat exchange with flue gas from the boiler; an improved method of preheating said feedwater prior to its introduction into said economizer which comprises passing said feedwater through a preheater heat exchanger prior to its introduction into said economizer, conducting a first portion of steam from said boiler through a first conduit and into said preheater heat exchanger to heat said feedwater therein, conducting a second portion of steam from said boiler through a second conduit and into said



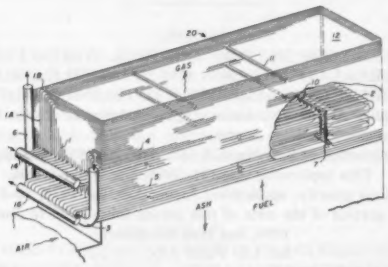
preheater heat exchanger to heat said feedwater therein, controlling the flow of steam through said first conduit in response to the temperature of feedwater entering said economizer whereby the temperature of the feedwater entering said economizer is above the dew point of the corrosive acids in the flue gas passing through said economizer, and controlling the flow of steam through said second conduit in response to the temperature of the exit gas from said exhaust stack to maintain the temperature of the flue gas above a predetermined temperature which will minimize corrosion within the exhaust stack due to the condensation of corrosive acids therein.

4,173,950

COAL FIRED FLUID BED MODULE FOR A SINGLE ELEVATION STYLE FLUID BED POWER PLANT

Richard E. Waryasz, Chicopee, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 3, 1978, Ser. No. 921,927
Int. Cl.[2] F22B *1/02;* **F23D** *19/02*
U.S. Cl. 122—4 D **12 Claims**



1. A fluidized bed for the combustion of particulate fuel comprised of waterwall tubing having inlet and outlet ends thereof arranged to form a rectangular enclosure that surrounds a combustion chamber and has open areas at the bottom and top thereof for the inlet and outlet of fuel and air, a source of cooling fluid, an outlet header connected to the oulet ends of said waterwall tubing and arranged to receive the cooling fluid

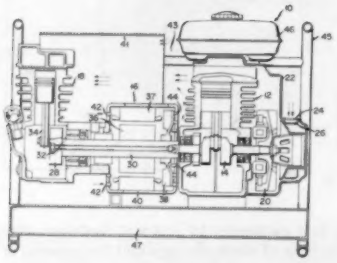
after it has circulated therethrough, and an "L" shaped inlet header adjacent the periphery of said fluidized bed adapted to supply cooling fluid from said source of cooling fluid to the inlet ends of said waterwall tubes for circulation to the outlet header.

4,173,951

POWER PLANT FOR SIMULTANEOUSLY GENERATING ELECTRIC POWER AND PNEUMATIC PRESSURE

Masamitsu Ishihara, 628 Hirai, Kannami-cho, Tagata-gun, Shizuoka-ken, Japan

Filed Oct. 28, 1977, Ser. No. 846,453
Claims priority, application Japan, Jun. 9, 1977, 52-75375
Int. Cl.[2] F02B *63/04, 63/06*
U.S. Cl. 123—2 **1 Claim**



1. A power plant for simultaneously generating electric power and pneumatic pressure, comprising: an engine having a crankshaft and a fan disposed on said crankshaft outside said engine, a dynamo for generating electric power and having a shaft drivingly coupled to the crankshaft of said engine, a compressor for generating pneumatic pressure and having a piston rod having one end thereof eccentrically drivingly connected to said crankshaft of said dynamo for rotation therewith, said engine, dynamo and compressor being arranged parallel to and substantially in alignment with each other, and a cover enclosing said dynamo and compressor and provided with an opening positioned above said dynamo, said dynamo being juxtaposed between said engine and said compressor and having a fan disposed on that side of the dynamo which lies adjacent said engine, and means for cooling said compressor comprising air streams produced by said fan of said engine coverging with air streams produced by said fan of said dynamo and air streams sucked in through said opening of said cover being carried toward said compressor.

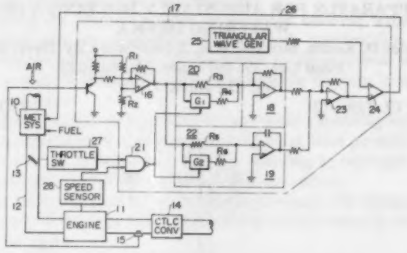
4,173,952

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH IMPROVED RESPONSE CHARACTERISTIC TO IDLING CONDITION

Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 678,667, Apr. 20, 1976, abandoned. This application Jan. 31, 1978, Ser. No. 873,960
Claims priority, application Japan, Apr. 24, 1975, 50-49174
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] F02B *3/00, 75/10*
U.S. Cl. 123—32 EE **3 Claims**

1. A mixture control system for internal combustion engines of the type including air-fuel supply means for supplying air and fuel for combustion, and exhaust means for carrying away exhaust gases after combustion, comprising: an exhaust gas sensor for detecting the deviation from a reference value of the concentration of a composition in said exhaust gases determined by said air-fuel supply means; means for generating a control signal varying proportionally to the magnitude of the deviation of said concentration from said reference value in a direction opposite to the direction of said deviation and for controlling said air-fuel supply means so that the ratio of air to fuel is controlled at a predetermined value; means for detecting an operating parameter of the engine indicative of an idling condition; and a switched resistor network providing a variable resistance value which increases in response to the detection of said operating parameter of the engine, said network being connected between the output of said comparator and the input to said control signal generating means to thereby reduce the amplitude of said control signal in response to the detection of an idling condition, whereby the time taken for air and fuel supplied to said engine to approach said predetermined value of air to fuel ratio is reduced.

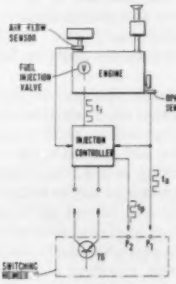


4,173,953

FUEL INJECTION PULSE SUPPRESSOR APPARATUS

Bernard Pocholle, Paris, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,291
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704180
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EL **4 Claims**



1. An apparatus for suppressing fuel injection control pulses, said control pulses serving to actuate fuel injection valves of an internal combustion engine, said control pulses being generated at least as a function of engine speed and air flow rate into the engine, and said apparatus including:

a reference circuit for generating reference pulses having a definite length termed reference length;

a first comparison circuit for comparing said control pulses with said reference pulses and for generating a first signal when said control pulses are shorter than said reference pulses;

a second comparison circuit for comparing said control pulses with said reference pulses and for generating a second signal when said control pulses are longer than said reference pulses;

a bistable multivibrator triggered by said first and second signals, respectively, to thereby be placed into one of two states; and

an output circuit, actuated by said bistable multivibrator, for suppressing said fuel injection control pulses during one state of said bistable multivibrator and wherein the improvement comprises:

said reference circuit is a monostable multivibrator having a single transistor, and each of said first and second comparator circuits includes a switching transistor, connected to the transistor in said reference circuit, the base of one of the switching transistors being connected to the collector of said single transistor, while the collector of the other switching transistor is connected to the collector of said single transistor and its base is connected to receive said control pulses;

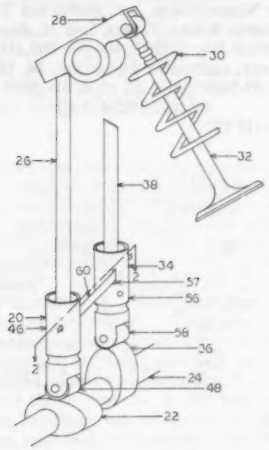
and wherein the collectors of said switching transistors are connected to the inputs of said bistable multivibrator and determine its status.

4,173,954

LIMITED ROTATION ROLLER TAPPET

Frank H. Speckhart, 534 Dellwood Dr., Knoxville, Tenn. 37919

Filed Dec. 13, 1977, Ser. No. 860,210
Int. Cl.² F01L *1/14*
U.S. Cl. 123—90.5 **11 Claims**



1. A non-rotatable valve lifter mechanism for actuating intake and exhaust valves in an internal combustion engine, comprising:

a first tubular member having a bifurcation formed in one end thereof, a first roller bearing mounted in said bifurcation of said first tubular member, said first tubular member having an aperture and a slot formed therein, said slot being substantially parallel to the longitudinal axis of said first tubular member;

a second tubular member having a bifurcation formed in one end thereof, a second roller bearing mounted in said bifurcation in said second tubulor member, said second tubular member having a slot and an aperture formed therein, said slot being substantially parallel to the longitudinal axis of said second tubular member; and

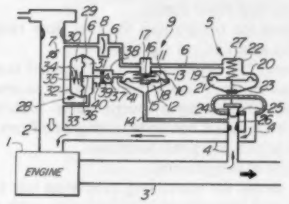
a locking bar supported by and preventing rotation of said tubular members, said locking bar having a first end portion, a first shoulder portion adjacent to said first end portion, a second end portion, a second shoulder portion adjacent to said second end portion, each said end portion being adopted to pass through both said slots and said apertures, each said shoulder portion having at least one dimension too great to allow passage through said apertures, the end portion of said locking bar passing through said apertures.

4,173,955

EXHAUST-GAS RECIRCULATION SYSTEM

Kinsaku Yamada; Chiaki Niida, and Teruo Takayama, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 15, 1977, Ser. No. 768,839
Claims priority, application Japan, Feb. 18, 1976, 51/15935
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**



1. An exhaust-gas recirculation system for an internal-combustion engine comprising an exhaust-gas recirculation passage which provides communication between the intake and exhaust pipes of the engine; an exhaust-gas recirculation valve having a valve inserted in said exhaust-gas recirculation passage to control the amount of exhaust gas flowing in said passage, a diaphragm connected with said valve, and a casing forming a chamber between the casing and said diaphragm; a vacuum conduit for introducing from said intake pipe the vacuum therein into said chamber, an atmospheric release orifice formed in said vacuum conduit, an exhaust-pressure transducer valve for controlling the amount of air introduced into said vacuum conduit through said atmospheric-release orifice in response to the pressure variation of said exhaust pipe; and an acceleration control unit for preventing the entry of air through said atmospheric-release orifice into said vacuum conduit in response to the pressure change in said intake pipe caused by acceleration of the engine, wherein said exhaust pressure transducer valve comprises a transducer valve casing, a second diaphragm dividing the inside space of said transducer valve casing into first and second chambers, a conduit for introducing the exhaust pressure in said exhaust gas pipe into said first chamber of said transducer valve, a passage for communicating said second chamber of said transducer valve with the atmosphere, a valve member fixed to the second chamber side of said second diaphragm for opening and closing said atmospheric-release orifice projecting into said second chamber of said transducer valve; and wherein said acceleration control unit comprises a control unit casing, a third diaphragm dividing the inside of the control unit casing into third and fourth chambers, said third chamber being subject to vacuum pressure from said intake pipe, said fourth chamber constituting an enclosed space, and a valve member fixed to said third diaphragm and arranged to open and close said passage for communicating said second chamber of said transducer valve casing with the atmosphere.

4,173,956

CLOSED LOOP FUEL CONTROL IN ACCORDANCE WITH SENSED ENGINE OPERATIONAL CONDITION

Kenji Ikeura; Masaaki Saito, both of Yokosuka, and Michiyoshi Yamane, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 17, 1977, Ser. No. 852,352
Claims priority, application Japan, Nov. 30, 1976, 51-144491
Int. Cl.² F02M *7/14*
U.S. Cl. 123—119 EC **9 Claims**

1. A closed loop fuel control system for an internal combus-

tion engine including means for supplying an air/fuel mixture to said engine, comprising:

(a) first means for sensing the concentration of a component contained in the exhaust gases emitted from said engine to produce a first signal indicative of the air/fuel ratio of the air/fuel mixture;

(b) second means for producing a second signal indicative of the difference in magnitude between said first signal and a reference signal;

(c) third means for producing a third signal in response to said second signal, said third means including a proportional-integral controller;

(d) fourth means for producing a control signal in accordance with said third signal;

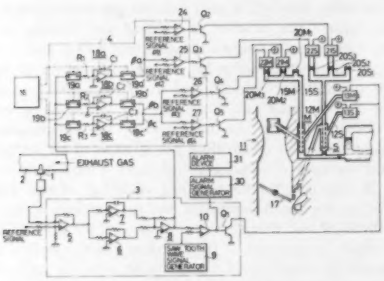
(e) fifth means for controlling the fuel flow rate in accordance with said control signal;

(f) sixth means for detecting the operational conditions of said engine in accordance with engine parameters, said sixth means producing a fourth signal indicative of an engine operational mode by selecting one from a plurality of modes which are predetermined;

(g) a plurality of integrators;

(h) seventh means for selectively supplying said third signal to one of said integrators in accordance with said fourth signal;

(i) eighth means for holding integrated voltages of the remaining integrators which are supplied with no signal from said seventh means until each of said integrators is



supplied with said third signal, each of said integrators integrating said third signal from the level of the holding voltage;

(j) ninth means for producing a second control signal by comparing each output signal of said integrators in magnitude with a plurality of reference signals;

(k) tenth means for selectively supplying each output of said integrators to said ninth means in accordance with said fourth signal; and

(l) eleventh means for controlling the fuel flow rate in accordance with said second control signal, the fuel flow rate being roughly controlled by said eleventh means, while the fuel flow rate is precisely controlled by said fifth means.

9. A closed loop fuel control system for an internal combustion engine including means for supplying an air/fuel mixture to said engine, comprising:

(a) first means for sensing the concentration of a component contained in the exhaust gases emitted from said engine to produce a first signal indicative of the air/fuel ratio of the air/fuel mixture;

(b) second means for producing a second signal indicative of the difference in magnitude between said first signal and a reference signal;

(c) third means for producing a third signal in response to said second signal, said third means including a proportional-integral controller;

(d) fourth means for producing a control signal in accordance with said third signal;

(e) fifth means for controlling the fuel flow rate in accordance with each control signal;

(f) sixth means for detecting the operational conditions of said engine in accordance with engine parameters, said sixth means producing a fourth signal indicative of an engine operational mode by selecting one from a plurality of modes which are predetermined;

(g) a plurality of storage means connected to said third means for storing said third signal;

(h) seventh means for selectively enabling one of said plurality of storage means in accordance with said fourth signal;

(i) eighth means for producing a second control signal by comparing each output signal of said storage means in magnitude with a plurality of reference signals;

(j) ninth means for selectively supplying each output of said storage means in accordance with said fourth signal to said eighth means; and

(k) tenth means for controlling the fuel flow rate in accordance with said control signal, the fuel flow rate being roughly controlled by said tenth means, while the fuel flow rate is precisely controlled by said fifth means.

4,173,957

ADDITIONAL AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

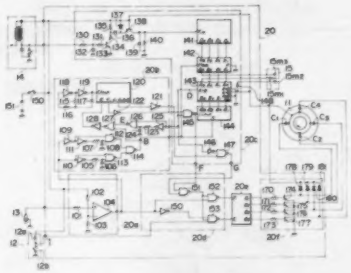
Tadashi Hattori, Okazaki; Akira Takata; Tamotsu Fukuda, both of Toyota, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 1, 1977, Ser. No. 802,311

Claims priority, application Japan, Jun. 14, 1976, 51-70006; Jun. 14, 1976, 51-70007; Jun. 22, 1976, 51-73717

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 EC **13 Claims**



1. In an additional air supply system for an internal combustion engine of the type including a combustion chamber for producing a power therein, an intake system operatively communicating with said combustion chamber for supplying thereto an air-fuel mixture, an exhaust system operatively communicating with said combustion chamber for conveying an exhaust gas from said combustion chamber to the atmosphere, an additional air supply pipe communicating with at least one of said intake and exhaust systems for supplying additional air thereto, to thereby control an air-fuel ratio of said air-fuel mixture at a desired value, air-fuel ratio detecting means disposed in said exhaust system for detecting the air-fuel ratio of the air-fuel mixture supplied with said additional air, control means operatively disposed in said additional air supply pipe for controlling the amount of the additional air to be supplied, drive means operatively connected with said control means for driving the same, and a control circuit electrically connected with said air-fuel ratio detecting means and said drive means for actuating said drive means in response to the detected air-fuel ratio, the improvement wherein said control circuit comprises:

an air-fuel ratio discriminating circuit connected with said air-fuel ratio detecting means for comparing the output

from said detecting means with a preset level and for generating a high level or a low level signal based on the comparison; and

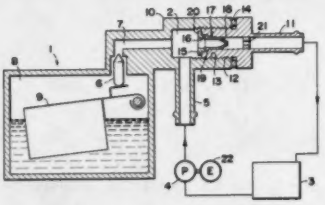
actuating means, connected with said discriminating circuit, for actuating said drive means at a first speed for a first period starting from a time when the signal from said discriminating circuit is changed from one level to the other level, said actuating means also actuating said drive means at a second speed for a second period starting from a time when said first period terminates and terminating at a time when the signal from said discriminating circuit is again changed from said other level to said one level.

4,173,958

CARBURETOR

Yuzo Kato; Akira Ii, both of Toyota, and Tetsuya Oniki, Anjo, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisan Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Sep. 12, 1977, Ser. No. 832,560
Claims priority, application Japan, Apr. 22, 1977, 52-46562
Int. Cl.[2] F02M *5/02*
U.S. Cl. 123—136 **5 Claims**



1. A carburetor in a fuel system in a motor vehicle of the type including a fuel tank, a fuel pump for delivering fuel under pressure to said carburetor and a return fuel line which returns fuel from said carburetor to said fuel tank when an excess amount of fuel is delivered to said carburetor by said fuel pump, said carburetor comprising:

a float chamber;

a fuel inlet communicating with said float chamber and coupled to said fuel pump;

a fuel outlet tube provided in said carburetor and communicating with said fuel inlet, said fuel outlet tube being coupled to said return fuel line; and

a check valve means provided in said fuel outlet tube for preventing fuel from said fuel tank from flowing to said carburetor, said check valve means comprising a cylindrically shaped check valve made from an elastic material and having a tip in the shape of a duckbill.

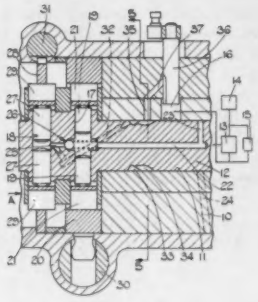
4,173,959

LIQUID FUEL INJECTION PUMPS

Stanislaw J. A. Sosnowski, and James C. Potter, both of London, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 24, 1978, Ser. No. 899,403
Claims priority, application United Kingdom, Apr. 30, 1977, 18168/77
Int. Cl.[2] F02M *39/00;* **F04B** *19/02, 3/00*
U.S. Cl. 123—139 AP **27 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a housing, a rotary distributor member located in the housing, an injection pump including a bore formed in the distributor member, a pump plunger located in said bore, and cam means for imparting inward movement to said plunger as the distributor member rotates, a delivery passage in the distributor member through which the fuel displaced from said bore during the inward movement of the plunger flows, a plurality of outlet ports in the housing said delivery passage communicating with said outlet ports in turn as the distributor member rotates so that the fuel displaced during successive inward movements of the plunger will flow to the outlet ports in turn, a further bore formed in the distributor member or in a port rotatable therewith, a further plunger in said further bore, conduit means connecting said bores, further cam means for imparting inward movement to said further plunger as the distributor member rotates, said further cam means being positioned so that fuel will be displaced from said further bore through said conduit



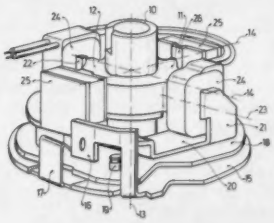
means to said first mentioned bore whilst the delivery passage is out of register with the outlet ports, valve means in said conduit means operable to allow fuel to flow to said first mentioned bore but to prevent the reverse flow of fuel, said valve means acting to ensure restriction to the flow of fuel to the first mentioned bore, and means operable in conjunction with said further cam means to determine the length of the stroke of said further plunger during which fuel can be delivered to said first mentioned bore.

4,173,960

INDUCTIVE IGNITION CONTROL PULSE GENERATOR IN AN INTERNAL COMBUSTION ENGINE DISTRIBUTOR

Aldo A. Padovese, Santa Barbara d'Oeste; Giuseppe M. B. Trevisan, and Emilio C. Sitar, both of Campinas, all of Brazil, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,228
Claims priority, application Brazil, Aug. 3, 1976, PI 7605079
Int. Cl.[2] F02P *3/02, 7/02*
U.S. Cl. 123—146.5 A **7 Claims**



1. A distributor for an internal combustion engine comprising, in combination:

a carrier plate (**15**);

a rotatably mounted shaft (**10**) passing through said carrier plate;

an interruptor-positioning plate (**18**) mounted on said carrier plate so as to be shiftable rotatably about the axis of said shaft in response to an engine condition;

rotor (**11**) of magnetically soft material having at least two pairs of diametrically opposed teeth or cusps (**12**) distrib-

uted about its periphery and having the same maximum radius dimension;

at least one pair of diametrically opposed coils (24) and at least one pair of diametrically poled permanent magnets (25) mounted in fixed relation to said interruptor-positioning plate, said coils being centered on an axis that is diametric with respect to said rotor and the facing portions thereof being close to the path of said teeth or cusps of said rotor, said magnets having like poles facing each other with facing portions close to the path of said teeth or cusps of said rotor, the magnets being circumferentially interposed between coils and vice-versa;

said coils of each pair being connected together to produce a common response;

the number of said teeth or cusps being equal to the sum of the number of said magnets and the number of said coils, or a multiple of said sum, and

the angles between successive rotor diameters (14) on which coil pairs and magnet pairs are aligned all being equal.

4,173,961

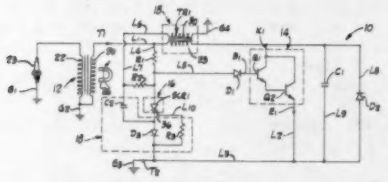
INDUCTIVE SOLID STATE MAGNETO IGNITION SYSTEM

William A. Howard, Troy Township, Ashland County, Ohio, assignor to Delta Systems, Inc., Twinsburg, Ohio

Filed Feb. 22, 1977, Ser. No. 770,647

Int. Cl.[2] F02P *1/00*; F02M *17/00*

U.S. Cl. 123—148 E **19 Claims**



1. In an inductive solid-state magneto ignition system having a magneto ignition coil with primary and secondary windings:

first circuit means including a first electronic control means for connection across the primary winding of the magneto ignition coil, said control means having power terminals and a control electrode and being changeable between conditions exhibiting low and high electrical impedances to establish and break a low resistance circuit across the primary magneto winding;

second circuit means for energization by the primary magneto winding and operatively connected to said control electrode for applying electrical energy from the primary magneto winding to the control electrode,

and third circuit means inductively coupled for power to said first circuit means, to increase and decrease the level of electrical energy applied to said control electrode, in response to the electrical energy generated in the primary winding of the magneto coil,

the electrical operation of all said circuit means being dependent solely upon magneto-generated energy.

4,173,962

IGNITION SYSTEM WITH ESSENTIALLY CONSTANT IGNITION COIL ENERGY SUPPLY

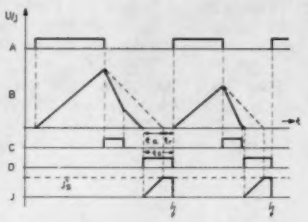
Friedrich Rabus, Schwieberdingen, and Günter Gräther, Pinache, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,345

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703431

Int. Cl.[2] F02P *1/00, 5/04*

U.S. Cl. 123—148 E **12 Claims**



1. Ignition system for an internal combustion engine (E) having

an ignition coil (25);

a controlled main switch (24) connected in series with the primary (24) of the ignition coil and controlling current flow therethrough;

means (12) coupled to the engine providing a first signal occurring at the time in advance of the ignition instant, and a second signal subsequent to the first signal and commanding interruption of current flow through the coil to cause an ignition event;

and means controlling the duration of current flow through the ignition coil in advance of the ignition event to be essentially independent of the speed of the engine, and hence of the repetition rate of said first and second signals,

comprising, in accordance with the invention,

a memory (15, 30);

controlled memory loading means (13; 31, 33) loading the memory in the time interval between said second signal and a subsequent first signal, and accumulating a stored value therein representative of said time duration;

controlled memory clearing means (17, 30) unloading the memory in the time interval between the occurrence of the first signal and the occurrence of the next subsequent second signal at variable and controlled rates;

a timing means (18) establishing a timing interval connected to said controlled memory clearing means and controlling the unloading rate during the timing interval thereof to differ from the unloading rate subsequent to said timing interval;

and means (20, 21; 39) connected to and controlled by said memory (15, 30) and responsive to a predetermined storage or loading state of the memory controlling said main switch (24) to close the circuit through the primary of the ignition coil (25) to store magnetic energy therein in the interval after the memory has reached said predetermined storage state and before the occurrence of the second signal commanding interruption of the current flow through the coil to cause said ignition event.

4,173,963

ELECTRONIC MAGNETO IGNITION FOR INTERNAL COMBUSTION ENGINES

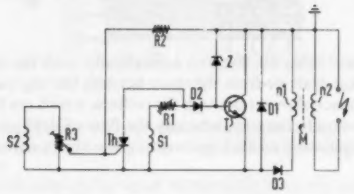
Erwin Heuwieser, Haar; Cosimo Scianna, and Klaus Wetzel, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,742

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630372

Int. Cl.[2] F02P *1/02;* **H05B** *41/36*

U.S. Cl. 123—149 D **9 Claims**



1. An electronic magneto ignition for an internal combustion engine which has a rotating fly wheel with a permanent magnet mounted thereon, comprising:

a magnetic ignition coil mounted adjacent the fly wheel and including a primary winding and a secondary winding for producing an ignition voltage, in response to rotation of the permanent magnet therepast;

a switching transistor including a base, an emitter and a collector, the emitter-collector circuit connected across said primary winding;

a first diode connected in parallel to said primary winding and poled opposite the emitter-collector circuit of said transistor; and

an electronic control circuit for blocking said switching transistor at a desired ignition time to interrupt the circuit of said primary winding and cause a high ignition voltage in said secondary winding for igniting the fuel mixture of the internal combustion engine, said control circuit comprising

a first control coil mounted adjacent the fly wheel spaced at a first angle from said ignition coil in the direction of rotation of the fly wheel,

a first resistor connected in series with said first control coil, said first resistor and said first control coil series combination connected across the base-emitter circuit of said transistor,

a thyristor including a control electrode, and a controlled conduction path connected in parallel with the first resistor-first control coil combination,

a second resistor connected as a feedback resistor between said collector and said control electrode,

a second control coil mounted adjacent the fly wheel,

a third resistor connected in parallel with said second control coil, said third resistor including a tap connected to said control electrode for applying a portion of the voltage induced in said second control coil to said control electrode,

a Zener second diode connected between said base and said collector of said transistor, and

a third diode connected between said first control coil-first resistor combination and said base of said first resistor.

4,173,964

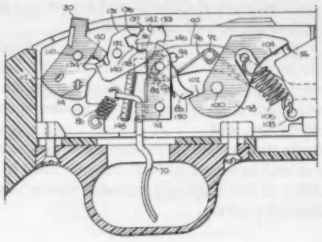
SAFETY FOR THE TRIGGER MECHANISM OF A GUN

Roger Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Feb. 4, 1977, Ser. No. 765,553

Int. Cl.[2] F41C *17/00;* **F41B** *11/06*

U.S. Cl. 124—40 **27 Claims**



1. A safety for the trigger mechanism of a gun comprising:

a gun frame;

a trigger carried by said frame for movement between first and second positions;

means carried by said frame for firing the gun in response to movement of said trigger into said second position;

a safety element carried by said frame for movement between safe and fire positions;

means coupled to said safety element for preventing movement of said trigger into said second position when said safety element lies in said safe position and enabling movement of said trigger into said second position when said safety element lies in said fire position; and

means coupled to said safety element for returning said safety element to its safe position in response to movement of said trigger between its first position and its second position.

4,173,965

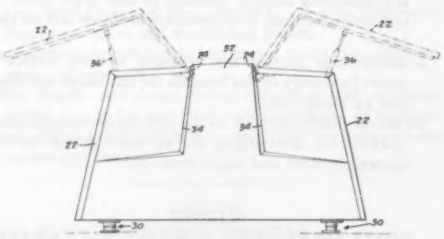
PASSENGER VEHICLE APPLIED TOP CONTAINER

Robert G. Vallee, and Arnold P. Saviano, both of Grosse Pointe Woods, Mich., assignors to George P. Johnson Co., Warren, Mich.

Filed Dec. 21, 1977, Ser. No. 862,866

Int. Cl.[2] B60R *9/04*

U.S. Cl. 224—328 **1 Claim**



1. A readily removable car top and security container combination which comprises:

(a) a plurality of anchor blocks secured to a car top in spaced relation,

(b) a relatively rigid, closable container having a base with upper and lower surfaces, end walls, and a top wall with one or more hatch openings above the side edges of the base extending to the top,

(c) a plurality of upper fastening fixtures permanently secured to said base in locations registering respectively

with said anchor blocks, said anchor blocks and fixtures having complemental mating spherical surfaces between the car top and the base of said container adaptable to engage in any one of a plurality of angular dispositions of said anchor blocks relative to said base, and having an overall vertical dimension to space said base upwardly from said car top,

(d) manually movable means accessible only from the interior of said container to connect and disconnect said upper fastening fixtures to said anchor blocks,

(e) one or more closure panels movably secured on said container movable to close said one or more hatch openings to seal the interior of said container from the weather,

(f) a recess formed in the base of said container at each upper fastening fixture, and

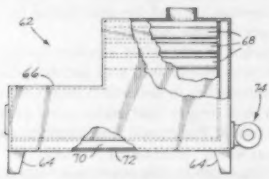
(g) a rotatable disc in said recess depressed below the upper surface of said base and affixed to a lock shaft to facilitate the rotation of said manually movable means to a connect or disconnect position.

4,173,966

SELF-CONTAINED HEATING APPARATUS

Richard O. Scharen, 461 Blackstone, Springfield, Oreg. 97477

Filed May 16, 1977, Ser. No. 796,854
Int. Cl.² F24B *7/04*
U.S. Cl. 126—121 **2 Claims**



1. A self-contained heating apparatus comprising:

a combustion chamber having spaced-apart and vertically staggered upper and lower front walls, side and rear walls and top and bottom walls,

a flue extending upwardly from an opening in said top wall,

an air chamber including outer side walls and an outer rear wall surrounding and spaced from said side and rear walls respectively,

multiple air ducts disposed between said flue and said bottom wall which extend from openings in said rear wall to corresponding aligned openings in said upper front wall, said air ducts being in communication with said air chamber,

a substantially horizontally arranged heating surface disposed forwardly of and beneath the discharge openings of said air ducts, and

air mover means operable for circulating air through said air chamber for discharging the air through said air ducts outwardly from said upper front wall.

4,173,967

DRAFT AIR CONTROL FOR FIREPLACE GRATE

Rex M. Brown, 435 E., 1st N., Smithfield, Utah 84335

Filed Apr. 25, 1977, Ser. No. 790,449
Int. Cl.² F24B *13/02*
U.S. Cl. 126—143 **10 Claims**

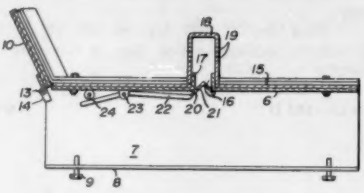
1. A fireplace grate comprising:

a flat, refractory tray, the rear and side edges of which are capable of sealed relationship with the walls of a fireplace;

support means for spacing the tray above the floor of a fireplace to provide an air space beneath the tray that is open at the front for free flow of draft air from a room;

a draft control comprising a hollow enclosure, open at the bottom thereof and having horizontal orifices in its sides; and

means for mounting the draft control over an opening in the central portion of the tray, the open bottom of the draft



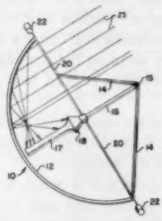
control being coextensive, substantially, with the opening, so that draft air from the space beneath the tray can enter the space above it through the orifices, which are the only openings in the tray, whereby the flow of draft air can be concentrated on fuel surrounding the draft control.

4,173,968

RECEIVER FOR SOLAR ENERGY

Willis G. Steward, Sugar Loaf Rd., Swiss Peaks, Boulder, Colo. 80302

Filed May 17, 1976, Ser. No. 687,137
Int. Cl.² F24J *3/02*
U.S. Cl. 126—438 **7 Claims**



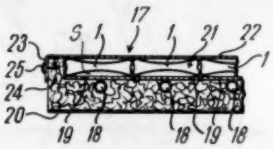
1. An articulated solar energy receiver adapted for use with a concave, fixed collector having a central axis, comprising:

an elongated member located with one end spaced from but adjacent to the concave face of the fixed collector and articulated for movement around a fixed point spaced from, and substantially on the axis of, the concave, fixed collector, the elongated member having means for utilizing solar energy disposed substantially along the entire length of the member, the elongated member further having at least one end portion of enlarged cross section relative to the central portion of the receiver, whereby solar energy reflected and concentrated by the fixed collector will be more completely intercepted by the receiver at the enlarged cross section and, accordingly, more solar energy will be directed to the means for utilizing solar energy.

4,173,969
LIGHT-PERMEABLE THERMAL INSULATION APPARATUS

Günter Schöll, Via Orselina 9, Locarno-Muralto, Switzerland (CH-660)

Filed Oct. 28, 1977, Ser. No. 846,449
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649472
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—417 17 Claims

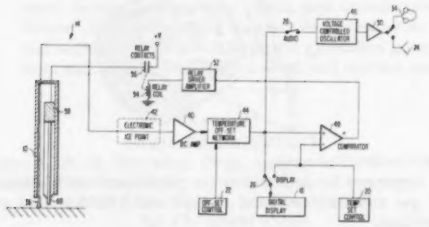


1. In a collector of solar energy, in combination:
a heat-conductive plate forming a flat supporting surface; and
a two-dimensional array of substantially identical contiguous transparent blocks carried on said supporting surface, each of said blocks being a thin-walled hollow glass body of generally prismatic configuration with a broad lower surface, a broad upper surface and four narrower sides formed in part by a pair of opposite sidewalls, said lower surface being concave and free from discontinuities and being mounted on at least three sides by a rounded ridge, at least some of said blocks resting directly on said plate with said ridge making line contact with said supporting surface at locations spaced inwardly from said sidewalls and encompassing a shallow dead-air space separating said lower surface from said supporting surface.

4,173,970
THERMOGRAPHIC DIAGNOSTIC METHOD AND SYSTEM

Abdulmajid U. Momin, Urbana, Ill., assignor to Jaymin Research Corporation, Urbana, Ill.

Filed Aug. 3, 1977, Ser. No. 821,511
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—736 8 Claims

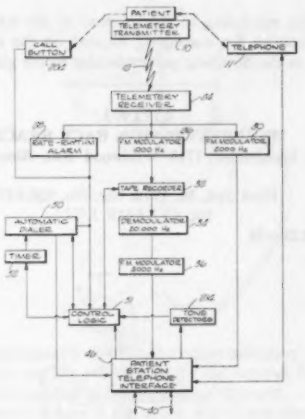


1. Apparatus for diagnosing pathological conditions in the human body that are manifested by an area exhibiting skin temperatures above a predetermined value in relation to surrounding areas, the apparatus comprising:
a hand held probe having a temperature responsive sensing element disposed at one end for contact with the skin surface of an area of the human body for providing a signal related to skin temperature at the location of contact;
a marking pen carried by said hand held probe adjacent the temperature responsive sensing element and movable between a retracted non-marking position and an extended marking position wherein said marking pen is biased into contact with the skin surface for selectively placing a visual indication on the skin at the approximate location of contact between the skin surface and the sensing element; and
means for biasing and holding said marking pen in contact with the skin surface in response to the temperature related signal exceeding a preselected value.

4,173,971
CONTINUOUS ELECTROCARDIOGRAM MONITORING METHOD AND SYSTEM FOR CARDIAC PATIENTS

Allen E. Karz, 16820 Chatsworth St., Granada Hills, Calif. 91344

Filed Aug. 29, 1977, Ser. No. 828,368
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—702 38 Claims



1. System for providing cardiac information from a cardiac patient to a remote station comprising:
means for recording electrocardiogram signals produced by the patient in real time at a first predetermined rate;
means for reproducing said recorded signals at a second predetermined rate, said second predetermined rate being greater than said first predetermined rate thereby compressing the time required to reproduce said signals as compared to the time to record said signals;
means for monitoring said reproduced signals;
a communication interface which includes a telephone system having direct dialing capability coupling said reproducing means to said monitoring means;
an automatic telephone dialing means coupled to said telephone system; and
timer means, said timer means activating said automatic dialing means for controlling the periodicity of transmission of recorded signals from said recording means to said monitoring means.

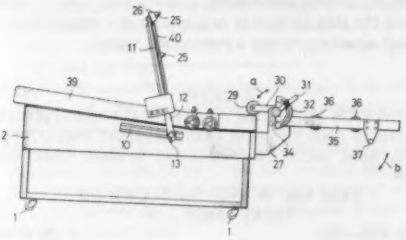
4,173,972
MASSAGING MACHINE

Katsuji Kodera, 35-12, Wada 1-chome, Suginami-ku, Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 832,027
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—52 6 Claims

1. A massaging machine comprising a machine base, a mobile frame reciprocally moveable on a machine base, a backrest frame mounted to the machine base in the manner that its mounting position may be changed and it may be inclined freely, a sliding frame mounted loosely to two guide rods extending parallel to each other in the vertical direction at the

back-rest frame, a screw rod parallel to the guide rods being inserted in the sliding frame and the said frame, in turn, being



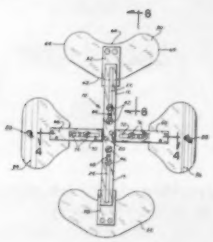
transferable according to the rotation of the screw rod, and two projections for massaging located on the sliding frame arranged in the direction perpendicular to the guide rods.

4,173,973

HYPEREXTENSION BACK BRACE

David J. Hendricks, 1718 Wildwood Rd., Bloomington, Ill. 61701

Filed Jun. 30, 1978, Ser. No. 920,937
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **10 Claims**



1. A hypertension brace including a rigid main cruciform structure adapted to overlie the anterior thoracic area of the human body and having upper and lower vertically alined vertical arms and right and left horizontally alined horizontal arms, sternum and pubic pads disposed respectively at the free ends of the upper and lower arms and right and left side pads disposed respectively at the free ends of the right and left arms, a back pad for contact with the back of the body and right and left means for attaching the back pad to the right and left pads, characterized in that each arm is of two-piece construction comprising a fixed part forming a rigid part of the cruciform structure and a movable part longitudinally adjustable relative to its fixed part, the pads being affixed respectively to the movable parts, and a plurality of means is provided for securing the movable parts in individually selected positions.

4,173,974

RESTRAINING MEANS

Robert J. Belliveau, 34 Ryder Rd. S., Weymouth, Mass. 02190

Filed Sep. 21, 1977, Ser. No. 835,063
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **18 Claims**

1. A restraining device for retaining an individual in a predetermined location, said device comprising,

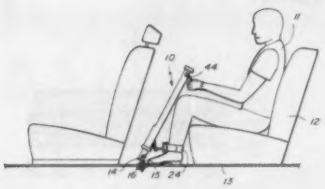
a rigid support member having a length of at least twelve inches,

first means for releasably locking a hand restraint device at one end of said support,

means for releasably locking a second end of said support to a mounting means at a fixed location,

means for releasing said first means with said releasing means being non-accessible to the individual whose hands are restrained,

second means for restraining the feet of an individual with said second means being located between said first means and said second end,



said support member being elongated and defining a cutout notch,

said first means comprising a rod acting to close said notch to retain said hand restraint device or open said notch to allow release of said hand restraint device,

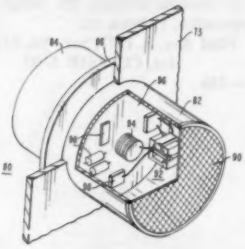
said rod being spring loaded and having a lever for actuating opening of said notch.

4,173,975

MAGNETIC MEANS FOR DETERMINING PARTIAL PRESSURE OF OXYGEN PARTICULARLY IN UNDERWATER BREATHING APPARATUS

Daniel L. DeLong, Stevensville, and Edward L. Rich, III, Arnold, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1978, Ser. No. 875,654
Int. Cl.[2] A62B *7/00;* **G01R** *33/12*
U.S. Cl. 128—142 R **3 Claims**



1. Apparatus for determining the partial pressure of oxygen in a gas mixture containing oxygen and a background gas comprising:

(A) a magnetic circuit including a magnetic flux source and opposing pole pieces defining a gap;

(B) a piezoelectric bender unit;

(C) a reference chamber having a magnetic susceptibility similar to said background gas;

(D) said reference chamber being arranged for oscillatory movement into and out of said gap by means of said bender unit;

(E) drive means for oscillating said bender unit;

(F) circuit means for measuring the change in magnetic flux in said magnetic circuit due to said reference chamber oscillating into and out of said gap to provide an output signal indicative of said oxygen;

(G) said reference chamber being hollow and containing a gas therein; and

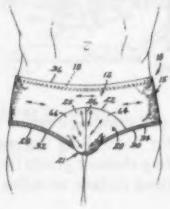
(H) means for equalizing the pressure of said gas within said reference chamber with the pressure of said gas mixture.

4,173,976

POUCH DESIGN BRIEF

Lynn M. H. Bloomquist, Minnetonka, and Robert J. Brazil, Bloomington, both of Minn., assignors to Munsingwear, Inc., Minneapolis, Minn.

Filed Oct. 19, 1977, Ser. No. 843,590
Int. Cl.[2] A41B *9/02*; A61F *5/40*
U.S. Cl. 128—159 **4 Claims**



1. A men's undergarment, comprising:

(a) a body member sized to encircle the body and further comprising:

(i) a front panel having top, bottom, and side edges, said bottom edge having a concave arcuate portion;

(ii) a rear panel having top, bottom, and side edges, said edges converging from said bottom to said top edge of said rear panel in a direction generally toward the midline of said rear panel and at an acute angle with respect to said midline, said rear panel joined to said front panel along said side edges of said front and rear panels forming side seams oriented at a slight angle with respect to the vertical so that said body member rides higher on the back than on the front of the body;

(b) a crotch member having a bottom portion and a pair of symmetrical wing members, each wing member having a lateral edge and a convex arcuate end edge, said wing members joined to each other along said lateral edge to form a vertical seam and joined along said convex arcuate edges to said concave arcuate portion of said bottom edge of said front panel to form an arcuate front seam, said bottom portion joined to said bottom edge of said rear panel forming a suspensory pouch, said crotch member formed of material having a stretch bias oriented so that said suspensory pouch will stretch in a direction generally from said arcuate front seam toward said vertical seam.

4,173,977

AEROSOL INTERFACE

Henry L. Burns, Beaverton, Oreg., assignor to Cavitron Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,259
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—201 **43 Claims**

1. An aerosol interface comprising:

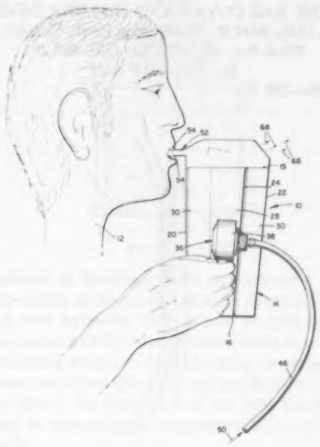
A. a housing defining a fluid receiving chamber having an upper end and a lower end in open communication with the atmosphere,

B. inlet means disposed on said housing between said upper and lower ends for permitting continuous delivery to said chamber of a flow of aerosol fluid so as to obtain an accumulation of the aerosol fluid therein for inhalation by a patient using the aerosol interface,

C. breath transmission means operatively associated with said housing and having a passageway therethrough, said passageway being defined by an inner opening at one end thereof in direct continuously open fluidic communication with said chamber and extending above said inlet means, and an outer opening at the other end thereof, with upper and lower surfaces extending intermediate said ends,

D. said outer opening being adapted for communication with the breath of a patient using the aerosol interface for the inhalation through said passageway of the aerosol fluid in said chamber and the exhalation of expired fluid by the patient into said passageway,

E. outlet means operatively associated with said housing in open communication with said chamber and with the atmosphere, said outlet means comprising a channel in



direct continuously open fluidic communication with said chamber to permit a flow path for the expired fluid from the patient to exhaust to the atmosphere, and

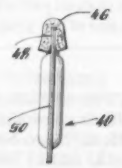
F. flow control means at the upper end of said chamber for fluidically coupling said transmission means and said outlet means so as to cause substantially all of the expired fluid during exhalation from said passageway inner opening to flow in open communication to the atmosphere through said channel of said outlet means without flowing into said chamber.

4,173,978

SELF CONTAINED ANTISEPTIC APPLICATOR SWAB

James B. Brown, R.F.D. #2, Box 313, Mt. Kisco, N.Y. 10549

Filed Jul. 7, 1977, Ser. No. 813,496
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—269 **5 Claims**



1. A disposable antiseptic applicator swab manufactured on a blister forming and sealing machine comprising: a cylindrical crushable glass ampoule having antiseptic liquid therein, a plastic blister package having identical complimentary parts forming a chamber and a flange section, the latter being provided with a channel extending from said chamber to the edge of said flange, said flange having undercut portions at the side edges of said flange adjacent to said channel, the cross section of said blister chamber being slightly larger than the cross section of said ampoule resulting in a relatively tight fit of said

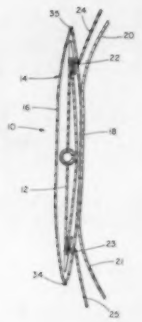
ampoule in said blister chamber, and an elongated applicator foam tip folded over said flange at the end thereof having said channel and in communication with the latter so that said antiseptic liquid will penetrate said foam tip when said glass ampoule is crushed, the width of said elongated applicator pad being greater than the width of said flange having the channel therein to prevent contact of the edges of said flange with the channel therein from contact with a patient.

4,173,979

URINE BAG COVER AND HOLDER DEVICE

Johnnie M. Odis, 4941 W. Washington Blvd., Chicago, Ill. 60644

Filed Jun. 10, 1977, Ser. No. 805,291
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 **5 Claims**



1. For use in an assembly which includes a reusable urine bag which is made of a flexible material that is irritating to human skin and which has flexible mounting straps extending therefrom, an improved combination cover and holder device which is constructed of a cloth material made from a natural or synthetic fiber which is substantially non-irritating to human skin and which includes a generally rectangularly shaped bag portion with an outer wall and an inner wall, each wall being secured along two opposite side edges thereof and along at least parts of a bottom edge thereof to the adjacent other wall, the adjacent side edges of the walls along the top edge of the bag portion being unattached along a major portion of their length to define an opening therebetween for receiving the reusable urine bag, said inner wall having two pairs of spaced apart slits, each slit being aligned with the connection of one of the mounting straps of the urine bag to the urine bag and said device further including two pairs of straps, each strap having a free outer end and an inner end which is secured to the outer surface of said inner wall adjacent one of said slits and each strap being in a position to extend partially around a human leg and between the leg and one of the urine bag mounting straps.

4,173,980

CORNEAL RESURFACING APPARATUS AND METHOD

Brian J. Curtin, 32 E. 64th St., New York, N.Y. 10021

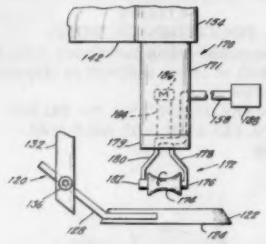
Filed Feb. 25, 1977, Ser. No. 771,942
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—303 R **40 Claims**

1. A corneal resurfacing apparatus comprising:

a circumcorneal suction ring for fixing the eye whose cornea is to be resurfaced so that the eye does not move as it is being resurfaced and for also stiffening the cornea; means connected with said suction ring for transmitting suction thereto, means for moving said suction ring into engagement with the eyeball whose cornea is to be resurfaced;

a grinding element for being moved into contact with the anterior corneal surface of the eye whose cornea is to be resurfaced, and said grinding element being comprised of a material adapted for grinding the corneal surface;

means for positioning said grinding element over the anterior corneal surface;



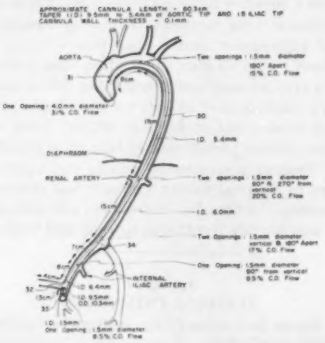
means for moving said grinding element to grind the corneal surface; means for controlling the manner and extent to which said grinding element grinds the corneal surface for grinding the corneal surface to define an optical surface.

4,173,981

CANNULA FOR ARTERIAL AND VENOUS BYPASS CANNULATION

J. D. Mortensen, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed May 23, 1977, Ser. No. 799,418
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **17 Claims**



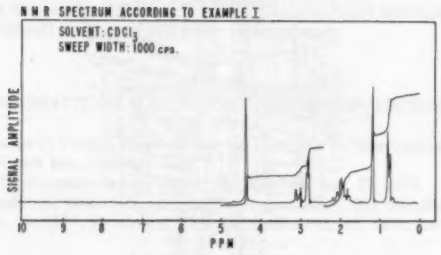
1. A cannula for partial emplacement within a patient's circulatory system to effect extracorporeal fluid transfer therewith, said cannula including a tubular member having inner and outer surfaces of blood and tissue compatible material, and further comprising a nonporous tube section for accomplishing extracorporeal fluid transfer to or from a second tube section which communicates therewith through a junction occurring at a terminal portion of said nonporous tube section with a nonterminal portion of said second tube section, said second tube section having concurrent bidirectional flow capability along bidirectional paths commencing at said junction and continuing toward distal ends of said second tube section, said second tube section having a tapered body along at least one of the bidirectional paths toward said distal ends, said second tube section having a plurality of openings located along the length thereof to effect proper fluid transfer.

4,173,982

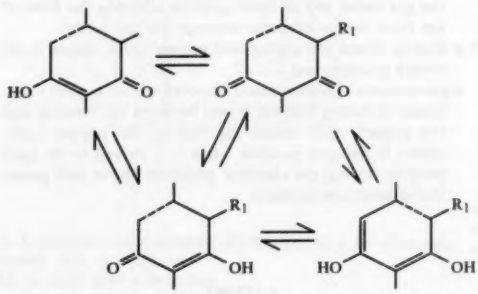
USE OF SUBSTITUTED DIMETHYL DIHYDROXY BENZENE AND CYCLOHEXADIENE COMPOUNDS FOR AUGMENTING OR ENHANCING THE TASTE AND/OR AROMA OF SMOKING TOBACCOS

John B. Hall, Rumson; Mark A. Sprecker, Sea Bright, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Frederick L. Schmitt, Holmdel, and Joaquin F. Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 800,889, May 26, 1977, Pat. No. 4,115,431.
This application Jun. 8, 1978, Ser. No. 913,717
Int. Cl.[2] A24B *3/12*; A24D *1/00*
U.S. Cl. 131—9 3 Claims



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing an organoleptic property modifying quantity of a substituted dimethyl dihydroxy benzene or cyclohexadiene represented by the equilibrium mixture of a constituent thereof:



wherein R_1 is selected from the group consisting of acetyl having the structure:

and nitrile having the structure:

$$-[C\equiv N]$$

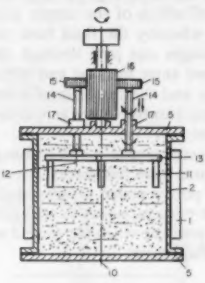
and wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond with the proviso that when the dashed line represents a carbon-carbon single bond R_1 is only nitrile with a smoking tobacco.

4,173,983

METHOD OF IMPROVING THE WORKING PROPERTIES OF LIQUID SYSTEMS

Semyon I. Fishgal, Winnipeg, Canada, assignor to International Design and Development Corporation, Cedar Falls, Iowa

Filed Oct. 3, 1977, Ser. No. 838,580
Int. Cl.[2] G05D *7/00*
U.S. Cl. 137—13 8 Claims



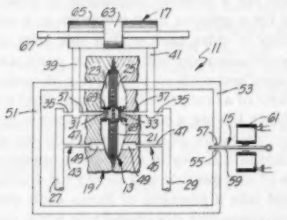
1. A method of breaking down contaminants containing magnetic materials in liquids of hydraulic systems to a size not interferring with hydraulic units of said systems by means of subjecting a volume of the contaminated liquid to an externally applied oscillating magnetic field changing the volumes of the contaminants and developing the stresses in them enough for their break down, the frequency of the field being not sufficiently high to eliminate the magnetrostrictive effect of the contaminants.

4,173,984

PNEUMATIC AMPLIFIER

Donald F. Solomon, Costa Mesa, Calif., assignor to S/P Product Design, Inc., Newport Beach, Calif.

Filed Jun. 12, 1978, Ser. No. 914,607
Int. Cl.[2] F15B *13/043*
U.S. Cl. 137—119 13 Claims



1. A fluid amplifier comprising:
a housing having a cavity therein;
a diaphragm in said housing dividing said cavity into first and second chambers on opposite sides of the diaphragm;
supply passage means in said housing for supplying fluid under pressure to said first and second chambers, said supply passage means including first and second supply passages for supplying fluid under pressure to the first and second chambers, respectively, said first supply passage terminating in a supply port in said first chamber and said second supply passage terminating in a second supply port in said second chamber;
said diaphragm being movable in said cavity to selectively substantially seal off said first and second supply ports;
a first control passage in said housing extending between said supply passage means and the first chamber;

a second control passage in said housing extending between said supply passage means and the second chamber;

first and second signal passages in said housing terminating in said first and second chambers, respectively;

said first control passage being in communication with said first signal passage through said first chamber regardless of which of the supply ports is sealed by the diaphragm;

said second control passage being in communication with said second signal passage through said second chamber regardless of which of the supply ports is sealed by the diaphragm whereby the fluid from the first and second control passages can pass through the first and second chambers and enter the first and second signal passages, respectively, and the presence of a restriction to flow in the first signal passage causes an increase in pressure in the first chamber;

first output passage means in said housing for receiving fluid under pressure from the supply passage means when the first supply port is sealed off by the diaphragm; and

second output passage means in said housing for receiving fluid under pressure when the second supply port is sealed off by the diaphragm.

4,173,985

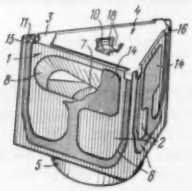
STRAIGHTWAY VALVE

Alexandr G. Kirpichenkov, ulitsa Komsomola, 45, kv. 29, Leningrad, U.S.S.R.

Filed Jul. 8, 1977, Ser. No. 814,094

Int. Cl.[2] F16K *15/14*

U.S. Cl. 137—512.1 **3 Claims**



1. A valve for a positive displacement machine such as a compressor for a gaseous fluid comprising, a valve body having a plurality of sides each with a side port and an internal cavity in communication with the side ports, said valve body having an open end with an inlet into said cavity for allowing entry of a flow of a compressible gaseous fluid into said cavity, said valve body having a closed end opposite said open end, a flow-divider internally of said valve body on said closed end extending into said cavity in a direction opposite to the direction of flow of said gas into said cavity for dividing the flow of gaseous fluid into a plurality of flows each directed to flow toward a corresponding one of said side ports, each side having a side port having a substantially planar valve seat peripherally of a corresponding side port, for each side of the body having a side port a valve plate, each valve plate comprising a reed-plate having a U-shape with two flexible mounting arms for mounting the reed-plate on said body and a connecting arm between said two mounting arms having a reed portion extending in a same direction as said mounting arms and seatable on a corresponding seat and overlying a corresponding side port, each mounting arm having an end tab for overlying said closed end of the valve body, a polygonal plate for overlying said closed end of the valve body and securing each reed-plate relative to a corresponding side of the valve body, said polygonal plate having lugs each disposed for overlying an end portion of a respective arm of a reed-plate to fix each reed-plate relative to a respective side and side port of the valve body, and means for fixing the polygonal plate on said closed end of said valve body, whereby each read-plate flexes including the mounting arms and reed portion thereof to open and close the corresponding side port under control of a respective one of said flows of gaseous fluid.

4,173,986

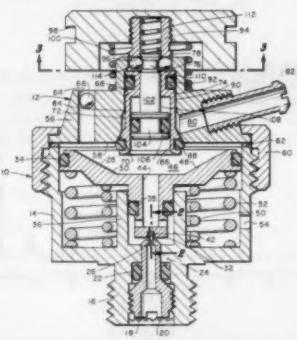
PRESSURIZED GAS FLOW CONTROL VALVE AND ASSEMBLY THEREOF WITH REDUCER REGULATOR

Richard L. Martin, Covina, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Apr. 18, 1977, Ser. No. 788,461

Int. Cl.[2] F16K *17/00, 31/12*

U.S. Cl. 137—613 **8 Claims**



1. A valve for supplying pressurized gas at greater than a preselected minimum pressure for downstream use, said valve comprising:

a housing forming a gas chamber having a gas inlet and a gas outlet;

a poppet valve means for moving between a closed position preventing the flow of gas from the gas chamber through the gas outlet and an open position allowing the flow of gas from the gas chamber through the gas outlet;

a biasing means for urging said poppet valve means to its closed position; and

a gas pressure sensitive means disposed within poppet valve means including locking means between the housing and the poppet valve means for locking the poppet valve means in its open position when it is moved to its open position during gas chamber pressures above said preselected minimum pressure.

4,173,987

POWER STEERING SYSTEM

Masanori Kouda, Atsugi, Japan, assignor to Atsugi Motor Parts Co., Ltd., Atsugi, Japan

Filed Dec. 21, 1977, Ser. No. 862,832

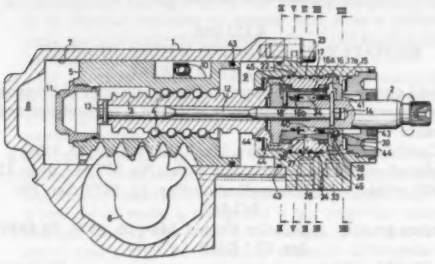
Claims priority, application Japan, Feb. 16, 1977, 52-15692; Feb. 16, 1977, 52-17546[U]

Int. Cl.[2] F15B *9/10*

U.S. Cl. 137—625.23 **9 Claims**

1. In a hydraulic power steering system, having an output shaft, including a rotary control valve contained in the valve chamber, said rotary control valve including an inner valve member rotatable with the input stub shaft and formed on its outer periphery with axially extending equally spaced pressure and return slots, an outer valve member concentrically mounted on said inner valve member in sliding contact therewith for rotation with the output shaft, said inner valve member having a portion defining an annular recess on its inner periphery and an orifice radially extending therethrough for

communication of said annular recess with said pressure slot to permit the supply of pressure fluid into said annular recess so



that no pressure difference occurs between the inner and outer peripheral surfaces of said inner valve member.

4,173,988

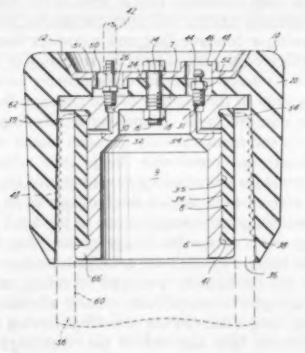
PNEUMATICALLY ACTUATED THREAD PROTECTOR FOR PIPES

William P. Fowler, Weatherford, Tex., assignor to Weatherford-/Lamb Inc., Houston, Tex.

Continuation-in-part of Ser. No. 825,329, Aug. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 792,286, Apr. 29, 1977, abandoned. This application Feb. 10, 1978, Ser. No. 876,608

Int. Cl.[2] B65D *59/00*

U.S. Cl. 138—96 T **12 Claims**



1. A pneumatically actuated thread protector for externally threaded pipe, comprising:

(a) an inner sleeve including,

(i) a substantially cylindrical rigid member enclosed at a first end by an upper end wall and open at a second end thereof; and

(ii) a substantially cylindrical expansible member having, when unexpanded, an interior cylindrical surface in intimate contact with the exterior cylindrical surface of the rigid member (i), the expansible member having an upper lip and a lower lip, said expansible member being inflatably engagable with an internal surface of the pipe;

(b) a cylindrical thread shield member formed of a resilient material concentrically encircling the cylindrical inner sleeve (a) and spaced outwardly therefrom such that an annulus is provided between the inner sleeve (a) and said thread shield member to receive the end of the pipe;

(c) means for mounting the thread shield member (b) to the inner sleeve (a); and

(d) valve means for inflatably urging the expansible member into engagement with the pipe and for deflatably disengaging said expansible member from the pipe and wherein the upper lip and the lower lip of the expansible member (a) (ii) are each secured to the rigid member (a) (i) for sealing the expansible member thereto.

4,173,989

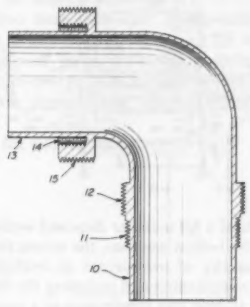
PREST-O-FIT UNIVERSAL ADAPTER FITTING

J. David Prest, 1313 6th Ave., Yuma, Ariz. 85364

Filed Jun. 12, 1978, Ser. No. 914,967

Int. Cl.[2] F16L *13/00*

U.S. Cl. 138—109 **10 Claims**



1. A universal one piece adapter fitting for connecting the sewage drain hose of a recreational vehicle to the input pipe of a sewage system, said fitting comprising in combination:

(a) a hollow connector having a first arm and a second arm;

(b) said first arm including:

i. a cylindrical end having a smooth external surface;

ii. a first male threaded section circumscribing said first arm, said first male threaded section being longitudinally displaced from said smooth surfaced cylindrical end; and

iii. a second male threaded section circumscribing said first arm; said second male threaded section being longitudinally and radially outwardly displaced from said first male threaded section;

(c) said second arm including:

i. a further cylindrical end having a smooth external surface;

ii. a female threaded section circumscribing said second arm, said female section being radially outwardly displaced from said smooth surfaced cylindrical end; and

iii. a third male threaded section circumscribing said second arm, said third male section being radially displaced from said female threaded section;

whereby, said connector interconnects the drain hose with any of a smooth surfaced, a male threaded or a female threaded sewage system input pipe.

4,173,990

TEMPORARY FABRIC AND METHOD AND APPARATUS FOR WEAVING SAME

Guy B. Langlois, and Raymond G. Spain, both of Huntington Beach, Calif., assignors to Hitco, Irvine, Calif.

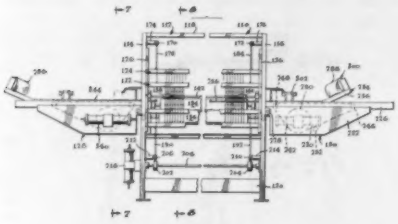
Filed Mar. 13, 1978, Ser. No. 886,266

Int. Cl.[2] D03D *47/02;* **D03C** *13/00*

U.S. Cl. 139—440 **6 Claims**

1. Apparatus for interweaving at least one elongated fibrous fill member with a plurality of elongated fibrous warp members to form a fabric for processing of the warp members comprising the combination of frame means, at least one generally cylindrical roller rotatably mounted on the frame means and adapted to support a plurality of elongated fibrous warp members, a pair of heddle arrangements slidable mounted on the frame means and each including a plurality of apertured members disposed adjacent the roller and adapted to receive selected ones of the warp members therein, means responsive to rotation of the roller for causing the heddle arrangements to

undergo reciprocating sliding motion relative to the frame means, at least one rapier assembly mounted on the frame means and including a hollow member adapted to receive a fill member therein and mounted to undergo linear motion along an axis between the roller and the pair of heddle arrangements, means responsive to rotation of the roller for causing the hollow member to undergo reciprocating motion along the axis and means for periodically generating a quantity of pressurized air adjacent an open end of the hollow member in a direction



to force a length of a fill member disposed within the hollow member out of the hollow member, the means for periodically generating a quantity of pressurized air including a second hollow member surrounding and including the first-mentioned hollow member therein and terminating in a nozzle surrounding the open end of the first-mentioned hollow member, means providing a source of pressurized air and means for periodically coupling the source of pressurized air to the inside of the second hollow member.

4,173,991

PNEUMATIC TIRE WITH ASYMMETRIC REINFORCING BELT

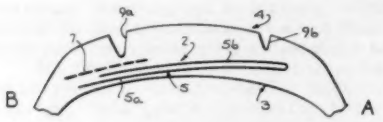
Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,671

Claims priority, application France, Apr. 6, 1977, 77 10428

Int. Cl.[2] B60C *9/18*

U.S. Cl. 152—361 FP **23 Claims**



1. A pneumatic tire having a tread and a carcass with a reinforcement belt incorporated between said tread and carcass, said reinforcement belt comprising, in cross-section, a ply of filiform elements coated with an elastomer, said ply being folded into two confronting parts of unequal lateral extent between an axially internal edge of the tread and an axially external edge of the tread, said axially internal edge facing the interior of a vehicle when the tire is mounted to the vehicle and said axially external edge facing away from said vehicle, no part of said reinforcement belt being disposed between the confronting parts of said folded ply, said fold being situated at the axially internal edge, said confronting parts including a main portion having the maximum width of said belt and having a first free lateral edge near the axially external edge of said tire, and an auxiliary portion of lesser width than said main portion, and having a second free lateral edge between said fold and the first free lateral edge of said main portion and wherein the distance between said reinforcing belt and said carcass increases in a lateral direction from the axially external edge of the tire to the axially internal edge and the diameter of said reinforcement belt is smaller at the axially external edge than at the axially internal edge, said tread including sculptures, said sculptures being deeper at the tread portion nearer the axially external edge than at the tread portion nearer the axially internal edge.

4,173,992

RADIALLY REINFORCED WHEEL RIMS OF MOLDABLE MATERIAL

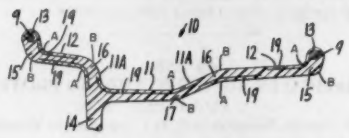
Daniel Lejeune, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation-in-part of Ser. No. 733,908, Oct. 19, 1976, abandoned, which is a continuation of Ser. No. 557,647, Mar. 12, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,862

Claims priority, application France, Mar. 25, 1974, 74 10201

Int. Cl.[2] B60B *5/02*

U.S. Cl. 152—381.1 **19 Claims**



1. In a reinforced single-piece type wheel rim of moldable material for a tire having as elements of the rim a sunken base with two sidewalls and comprising on one side of said sunken base a first rounding between said sunken base and a sidewall, each sidewall terminating in a second rounding, a bead seat adjacent each second rounding and a flange connected to each bead seat by a third rounding, two at least of the first, second and third roundings having different curvatures, each of the roundings having a concave face and a convex face, the improvement which comprises at least the rounding of maximum curvature has a tension-resistant reinforcement embedded in said rounding only in the vicinity of the concave face of said rounding, the reinforcement comprising reinforcing elements arranged solely and approximately in radial planes of the rim.

11. In a reinforced removable flange type wheel rim of moldable material for a tire having as elements of the rim a flat base, a bead seat on each side of the flat base as an extension thereof, a fixed flange connected to one of the bead seats by a first rounding and a removable flange at the other bead seat, said flat base being extended by a bulged portion which is connected to the flat base by a second rounding, said bulged portion having a groove intended to receive a locking ring for the removable flange, each of the roundings having a concave face and a convex face and one of the roundings having a greater curvature than the other, the improvement which comprises at least the rounding of greater curvature has a tension resistant reinforcement embedded in said rounding only in the vicinity of the concave face of said rounding, the reinforcement comprising reinforcing elements arranged solely and approximately in radial planes of the rim.

4,173,993

DOMESTIC APPLIANCE SYSTEM WITH THERMAL EXCHANGE FLUID

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 299,274, Oct. 4, 1972, Pat. No. 3,888,303, and a continuation-in-part of Ser. No. 567,647, Apr. 14, 1975, abandoned. This application Oct. 5, 1977, Ser. No. 839,618

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—48 R **7 Claims**

1. A system of appliances for exchanging heat between foods and latent heat storing materials by forced circulation of a liquid thermal exchange fluid comprising in combination

a plurality of appliances each in a heat exchange relationship with a food, each of the appliances having a single appli-

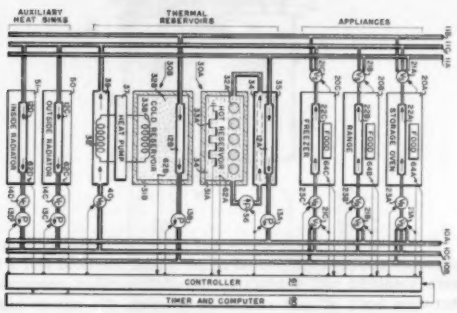
ance heat exchanger to receive the liquid thermal exchange fluid,

a hot reservoir having a latent heat storing material of sufficient thermal capacity to release heat over a period of peak use to the thermal exchange fluid and having means to charge the latent heat storing material,

a cold reservoir having a latent heat storing material to absorb heat over a period of peak use from the thermal exchange fluid and having means to charge the latent heat storing material,

a hot liquid thermal exchange fluid circuit connecting the appliances with the hot reservoir, said hot circuit including the appliance heat exchangers, a hot supply main and a hot return main, a pump and a hot reservior heat exchanger joining the hot supply main and the hot return main, said pump developing a pressure differential between the hot supply main and the hot return main,

a cold liquid thermal exchange fluid circuit connecting the



appliances with the cold reservoir, said cold circuit including the appliance heat exchangers, a cold supply main and a cold return main, a pump and a cold reservoir heat exchanger joining the cold supply main and the cold return main, said pump developing a differential pressure between the cold supply main and the cold return main,

selector valves connecting the appliance heat exchangers either between the hot supply main and the hot return main or between the cold supply main and the cold return main, and

regulator valves to regulate flow of the thermal exchange fluid through the appliance heat exchangers between the supply main and the return main selected by the selector valves to regulate appliance temperature and thereby using forced circulation of the liquid thermal exchange fluid in the hot circuit and the cold circuit to exchange heat between the foods and the latent heat storing materials through the appliance heat exchangers and the reservoir heat exchangers.

4,173,994

SOLAR ENERGY HEATING AND COOLING APPARATUS AND METHOD

Leland L. Hiser, Rte. 4, Box 361K, New Braunfels, Tex. 78130

Filed Dec. 30, 1977, Ser. No. 866,055

Int. Cl.[2] **F25B** *29/00;* **F28D** *13/00;* **F24D** *11/00;* **F24J** *3/02*

U.S. Cl. 165—48 S **13 Claims**

1. A system for heating and cooling an enclosed space from solar radiation comprising:

solar energy collector means for receiving a fluid and heating said fluid from said solar radiation;

control means of said system being connected to said collector means, said control means having at least a heating mode and cooling mode of operation;

conduit means connecting to said collector means;

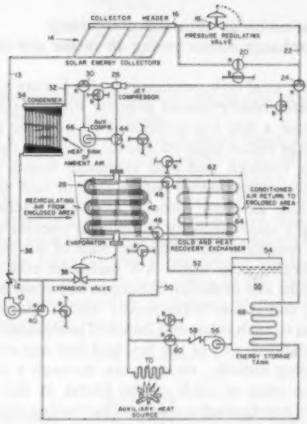
valving means in said conduit means operated by said control means;

a single energy storage tank being connected by said conduit means and valving means to receive said fluid from said collector means therein, said single energy storage tank storing said fluid in either heated or cooled state as regulated by said control means;

said system for heating including:

at least two heat exchanger means connected by said conduit means and valving means for heating air from said enclosed space circulated therethrough, and for heating an energy storage fluid in said energy storage tank from heated fluid received from said collector means;

said system for cooling including:



jet compressor means connected by said conduit means and valving means to receive pressurized and vaporized fluid from said collector means, said jet compressor means discharging into condenser means;

evaporative means receiving liquified fluid from said condenser means via said conduit means and said valving means, said evaporator means vaporizing said fluid in response to a low pressure drawn therein by said jet compressor means via said conduit means, said evaporator means thereby cooling said air from said enclosed space and said energy storage fluid in said energy storage tank;

control means operable to actuate said jet compressor means to provide cooling as required during sunlight hours and to store said energy storage fluid in said single energy storage tank for recovery during cooler hours when said jet compressor means is not required for cooling purposes,

first circulation means for moving said fluid through said conduit means and valving means to said collector means.

4,173,995

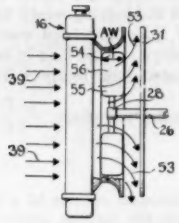
RECIRCULATION BARRIER FOR A HEAT TRANSFER SYSTEM

Harold D. Beck, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 603,490, Aug. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,090, Feb. 24, 1975, abandoned. This application Sep. 30, 1977, Ser. No. 838,193

Int. Cl.[2] F28F *13/06*

U.S. Cl. 165—51 **19 Claims**



1. A heat exchange apparatus comprising:

a heat exchange means having air intake and air discharge faces;

a rotatable axial flow, suction-type fan having a plurality of circumferentially spaced impeller blades extending radially from a hub and positioned on one side of said heat exchange means adjacent said air discharge face for drawing air through said heat exchange means axially in a direction from said air intake face to said air discharge face, said air flow through said heat exchange means having a major velocity component parallel with respect to the rotational axis of the fan, each of said blades having an effective axial width AW measured axially along the rotational axis of the fan between a first plane and a second plane, said planes being axially spaced and parallel with respect to each other and disposed substantially normal to the rotational axis of the fan, said first and second planes extending radially, respectively, through a point on the leading edge of each of the blades at the tip portion thereof and through a point on the trailing edge of each of the blades at the tip portion thereof;

shroud means having one axial end operatively connected to said heat exchange and encircling said fan, said shroud means being shaped and positioned with respect to said heat exchange means and the blades of said fan whereby the major velocity component of the air stream discharge by the fan is in a direction perpendicular to the direction of the major velocity component of the air stream entering the air intake face and flowing through said heat exchange means, said shroud means including a generally cylindrical, axially extending throat section, one axial end of said throat section substantially defining said one axial end of said shroud means operatively connected to said heat exchange means, said one axial end of said throat section lying substantially in a plane disposed substantially perpendicular to the rotational axis of said fan, one of said first and second planes being axially spaced from and on either axial side of said plane containing said one axial end of said throat section of said shroud means a distance of 12 percent of AW;

and means axially positioned on the side of said fan opposite said heat exchange means for obstructing flow of air axially through the fan at the hub region thereof in an axial direction opposite the direction of said major velocity component of air flow through said heat exchange means, said means lying substantially in a plane spaced and substantially parallel with respect to a radial plane substantially defining a second axial end of said shroud means opposite said one axial end of said throat section substantially defining said one axial end of said shroud means.

4,173,996

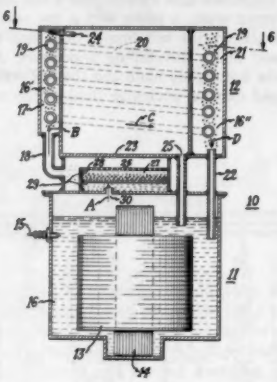
HEAT EXCHANGER ARRANGEMENT FOR VAPORIZATION COOLED TRANSFOMERS

Linden W. Pierce, Rome, Ga., assignor to General Electric Company, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,195

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—105 **2 Claims**



1. An improved heat exchanger of the type used with condensable coolants and including an intake manifold and a return manifold and a plurality of cooling tubes connecting between both of said manifolds wherein the improvement comprises:

an intake pipe connecting with the intake manifold for promoting the flow of vaporized coolant into the intake manifold;

a return pipe connecting with the return manifold for promoting the flow of condensed coolant out of the return manifold said vaporized coolant and condensed coolant flow being in the same direction within the return manifold;

said cooling tubes inclining from the intake manifold to the exhaust manifold to promote the flow of condensed coolant into the return manifold, said vaporized coolant and condensed coolant flow being in the same direction within the cooling tubes;

an expansion tank forming three divided sections which create the intake and return manifolds and an expansion area intermediate the intake and return manifolds and a connector between the intake manifold and the expansion tank for providing the flow of vaporized coolant into the expansion tank; and

a separate return pipe connecting with the expansion tank for promoting the flow of condensed coolant out of the expansion tank.

4,173,997

MODULAR STEAM GENERATOR

Harry N. Andrews, Export, Pa., and Robert F. Barry, St. Genese, Belgium, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1977, Ser. No. 771,140

Int. Cl.[2] F28F *3/00*

U.S. Cl. 165—158 **16 Claims**

1. A heat exchanger for transferring heat from a primary fluid to vaporize a secondary fluid, said heat exchanger comprising:

an elongated vertically oriented shell portion;

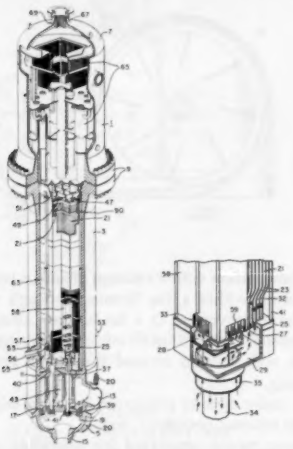
a lower head and an upper head portion forming end closures for said shell;

a first transversely disposed general horizontal plate having a periphery which extends to said shell, and is sealingly affixed thereto and which cooperates with said first plate to form a first compartment having inlet and outlet nozzles for said primary fluid and a second compartment having inlet and outlet nozzles for said secondary fluid;

a second transversely disposed general horizontal plate spaced from said first plate and having a periphery which extends to said shell and having a peripheral seal;

said second plate being so disposed within said first compartment so as to separate said primary fluid inlet nozzle from said primary fluid outlet nozzle;

a plurality of modular tube bundles disposed in said second compartment, each of said tube bundles having a plurality of generally U-shaped tubes forming a hot leg portion and



a cold leg portion, a tube sheet into which the ends of the tubes are secured, a pair of headers, one of said headers serving as an inlet header and the other of said headers serving as an outlet header, and conduits in fluid communication with each of said headers;

said transversely disposed plates having registering openings through which at least one of said conduits in communication with one of said headers passes and forms a seal therewith whereby primary fluid flows in series through said primary fluid inlet nozzle one of said conduits, said tubes, the other of said conduits, and then through the primary fluid outlet nozzle; and

means for transmitting secondary fluid from the secondary fluid inlet nozzle to at least the cold leg portion of said tube bundles adjacent said tube sheets, whereby the secondary fluid flows upwardly over the outside of said tubes and is vaporized and the vapor flows out through said secondary fluid outlet nozzle.

4,173,998

FORMED COIL ASSEMBLY

John Jahoda, McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,195
Int. Cl.[2] B23P *15/26*
U.S. Cl. 165—182 **9 Claims**

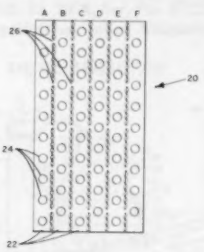
1. A method of manufacturing a formed coil having multiple single row coil cores of varying lengths such that when the coil is bent to the desired shape the coil rows will be in the appropriate location which comprises the steps of:

arranging in registration a plurality of sheets of plate fins, said fins having openings to receive tubular members and said fins being joined by at least one break away tabular portion such that upon an application of force the individual fins of the sheet may be separated;

lacing the sheets of plate fin by inserting tubes through the fin openings such that the fins are spaced along the tubes, said tubes being of varying length depending upon the final coil configuration desired;

expanding the tubes to form a tight fit between the fins and tubes, at least a part of the tabular portions connecting the fin sheets being ruptured during expansion such that said fins are spaced along the tubes of each coil core independently of the spacing of the fins along the adjacent coil core; and

bending the coil cores to the desired configuration.



5. A formed coil having multiple single row coil cores of varying lengths which comprises:

a first coil core having fins spaced along tubes; and

a second coil core of a different length than the first coil core and also having fins spaced along the length thereof, the fins in the first and second coil core having been made from sheets joined by tabular portions such that when the tubes were expanded to enhance heat transfer between the fins and the tubes, at least a part of the tabular portions were ruptured during the expansion so that fins from the sheets that were joined by the tabular portions are spaced dissimilarly along the coil cores.

4,173,999

TECHNIQUE FOR CONTROLLING LOST CIRCULATION EMPLOYING IMPROVED SOFT PLUG

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,642
Int. Cl.[2] E21B *33/138, 33/13*
U.S. Cl. 166—293 **4 Claims**

1. In the drilling of a well, the method of alleviating the loss of whole liquid drilling fluid into a lost circulation zone of an incompetent subterranean formation penetrated by said well, comprising:

(a) introducing into a drill string positioned in said well to extend to the vicinity of said lost circulation zone a slurry comprised of a nonaqueous liquid, a hydratable material in an amount sufficient to form a soft plug and within the range of 300 to 800 pounds per barrel of said nonaqueous liquid and a solids suspending agent comprised of oleophilic clay in an amount within the range of about 0.1 to 5.0 pounds per barrel of said nonaqueous liquid to suspend said hydratable material in said nonaqueous liquid;

(b) displacing said slurry down said drill string and into the vicinity of said lost circulation zone;

(c) displacing an aqueous liquid down an annulus formed about said drill string to mix said slurry and said aqueous liquid in said vicinity of said lost circulation zone and form a soft plug; and

(d) displacing said soft plug into said lost circulation zone to alleviate the loss of whole liquid drilling fluid thereinto.

4,174,000

METHOD AND APPARATUS FOR INTERFACING A PLURALITY OF CONTROL SYSTEMS FOR A SUBSEA WELL

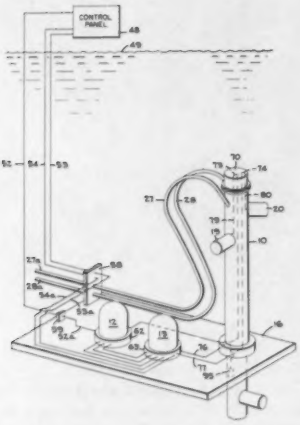
Lionel J. Milberger, Spring, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 16, 1978, Ser. No. 878,495

Claims priority, application United Kingdom, Feb. 26, 1977, 8218/77

Int. Cl.[2] E21B *33/035*

U.S. Cl. 166—362 **16 Claims**



6. Interfacing apparatus for dual control of a subsea wellhead having a plurality of valve operators for controlling a wellhead valve system, said apparatus comprising:

an electro-hydraulic control module for normally operating said valve operators;

a hydraulic control module for back-up operation of said valve operators;

means for selectively connecting one of said electrohydraulic control module and said hydraulic control module to said wellhead valve system;

a surface control unit for controlling the operation of said electro-hydraulic and said hydraulic control modules and for selecting the control module which operates said valve operators;

means for coupling control signals from said surface control unit to said valve operators when a tree cap is removed from said wellhead; and

means for directing the operation of said hydraulic control module while said electro-hydraulic control module is being removed and replaced.

13. A method of interfacing a plurality of control systems between a surface-mounted control panel and a subsea wellhead having a plurality of valve operators in a christmas tree at said wellhead, said method comprising the steps of:

(1) mounting a primary control module near said christmas tree, said primary control module having a primary control valve for each of said valve operators,

(2) mounting a back-up control module near said christmas tree, said back-up control module having a back-up control valve for each of said valve operators,

(3) providing selection means for selectively coupling each of said primary control valves or each of said back-up control valves to a corresponding one of said valve operators in said christmas tree,

(4) mounting said selection means near said christmas tree for easy replacement thereof without accessing said christmas tree,

(5) coupling selection signals between said control panel and said selection means to control the operation of said selection means, and

(6) coupling control signal between said control panel and said primary control module or said back-up control module to operate the control valves which are coupled to said valve operators.

4,174,001

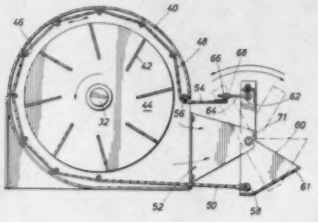
FAN HOUSING CLEAN OUT APPARATUS

Malcolm P. Ellis, Ashland, Me., assignor to Lockwood Corporation, Gering, Nebr.

Filed May 25, 1977, Ser. No. 800,408

Int. Cl.[2] A01D *33/02*

U.S. Cl. 171—17 **13 Claims**



1. In combination with a vacuum chamber which includes a fan operating within a fan housing through which mire is drawn, the improvement in a fan housing cleanout apparatus for preventing the build up of mire, comprising

support rods located around the inside periphery of the housing,

belting under tension positioned between said rods and the inside housing periphery, and

oscillating means connected for providing relative movement between said belting and rods thereby to flex said belting and to scrape said belting against said rods to loosen mire attempting to build up on said belting.

4,174,002

SOIL CULTIVATING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 625,083, Oct. 23, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,621

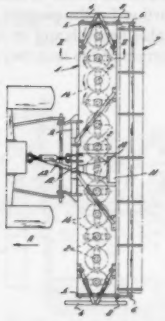
Claims priority, application Netherlands, Oct. 24, 1974, 7413903

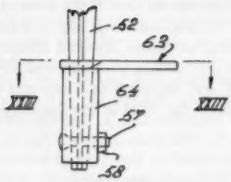
Int. Cl.[2] A01B *33/06, 33/10*

U.S. Cl. 172—49 **3 Claims**

1. A rotary harrow comprising a plurality of soil working members arranged in a transverse row, said members being rotatable about corresponding substantially vertically axes and being mounted on substantially vertical shafts that define said axes, driving means being connected to said shafts to rotate neighboring soil working members in relative opposite directions in order to work overlapping paths of soil, at least one of said soil working members comprising a support and a plurality of downwardly extending tines, at least one of said tines having a substantially straight soil working portion extending downwardly from said support and a chisel releaseably secured by bolt means adjacent the lower end of said portion, said chisel having a knife-like operative portion extending outwardly from said soil working portion in a substantially

radial direction, said chisel having a sleeve-like fastening portion that receives the lower end of the tine soil working portion





and said fastening portion of the chisel being located below the operative portion of said chisel.

4,174,003

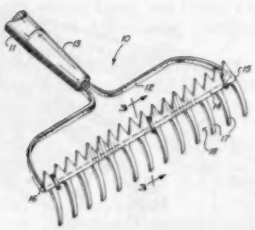
RAKE ATTACHMENT KIT

Lamberto C. Zepeda, 492 Santa Rita, Superior, Ariz. 85723

Filed Apr. 7, 1978, Ser. No. 894,340

Int. Cl.[2] A01B *1/20*

U.S. Cl. 172—375 **2 Claims**



1. A kit for converting a conventional rake including a back bar having a plurality of curved, long, thin, widely spaced tines depending therefrom to a rake including an attachment bar having a plurality of sawteeth substantially opposite to said tines and arranged in general back-to-back relation with respect thereto, said kit comprising:

(a) an attachment comprising a bar adapted to be arranged in substantially back-to-back relation with respect to the rake bar and having a plurality of sawteeth extending upwardly therefrom, said sawteeth adapted to be shorter, more closely spaced and wider than said tines; and

(b) means for removably securing said attachment bar to said rake bar, including,

(i) a plurality of plate assemblies each of which comprises a pair of complemental plates which are curved so as to be adapted to conform to the contour of said rake and attachment bars which are positioned therebetween, and

(ii) a pair of bolts and nuts for each plate assembly with one nut passing through the apices of adjacent sawteeth of the attachment bar and the other bolt adapted to pass between adjacent tines and below said rake bar, for clamping said plates towards each other.

4,174,004

ELECTRIC STORAGE BATTERIES

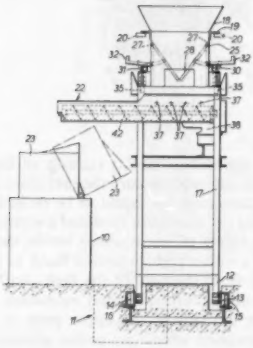
Edgar Ramsbottom, Bolton; William Whalley, Altrincham, and Edmund Bale, Brooklands, all of England, assignors to Chloride Group Limited, London, England

Filed Feb. 13, 1978, Ser. No. 877,383

Claims priority, application United Kingdom, Feb. 15, 1977, 6260/77

Int. Cl.[2] H01M *7/00*

U.S. Cl. 141—32 **14 Claims**



1. Plant for pasting battery plates comprising:

grid feeding means having an outlet path, first flat conveyor means having an inlet end and an outlet end and a drive motor, said grid feeding means being positioned so that said outlet path is juxtaposed to the inlet end of the flat conveyor whereby grids fed from the grid feeding means are deposited on the inlet end of the flat conveyor,

paste applying means having an inlet for receiving paste and an outlet for forcing paste into a grid conveyed on the conveyor past the said paste applying means, said first flat conveyor and said paste applying means together constituting a pasting machine,

a transportable hopper and mechanical discharge means for mechanically discharging paste into the inlet to the pasting applying means,

second conveyor means having an inlet end and an outlet end,

third conveyor means having an inlet end and an outlet end, the inlet end of the second conveyor being juxtaposed to the outlet end of the first conveyor, and the outlet end of the second conveyor being juxtaposed to the inlet end of the third conveyor,

a drying oven, the third conveyor passing through the drying oven,

paste recycling means having an inlet located below the outlet end of the first conveyor,

a flexible outlet pipe connected to the inlet to the paste applying means, and

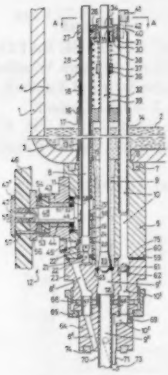
pump means disposed between the inlet and the outlet of the paste recycling means, whereby the paste recycling means is adapted to mechanically collect paste applied to the first conveyor at regions between the grids and to convey it back to the inlet to the paste applying means.

4,174,005

FLUID PRESSURE MEASURING DEVICE

Jean-Claude C. L. Vinois, 129, Rue Papenkasteel, Brussels, Belgium

Filed Nov. 9, 1977, Ser. No. 849,715
Claims priority, application Belgium, Nov. 10, 1976, 848195
Int. Cl.[2] B65C *3/00*
U.S. Cl. 141—54 **18 Claims**



1. In a plant for the isobarometric racking of liquid and filling of bottles under gaseous pressure the said plant comprising a rotating tank containing the liquid to be racked and the gas under pressure and on which are mounted a series of valve devices each for the filling of one separate bottle, each valve device consisting of a valve body which is fixed to the tank, extends downwardly from the base of the tank and has three conduits passing vertically through it and extending upwards through the liquid in the tank to the upper zone in the tank which forms a gas pressure where gas under pressure is contained, said first conduit conducts gas under pressure, said second conduit conducts the flow of liquid and said third conduit returns the gases, the improvement being that a device is situated in the said tank for the control of the opening of the flow of liquid and inside the gas pressure conduit a slidably mounted tube is coaxially and internally mounted said sliding tube having at the lower extremity a distributor consisting of a slide valve which extends the sliding tube downwards and a closing means coaxially connected with the said valve body and resting on said closing means said slide valve is manipulated by a mechanical control means, said valve and said closing means cooperating in such a way that by a succession of actions of said mechanical control means on the said slide valve, said slide valve and said closing means are brought into relative positions of sealing and of passage of gas under pressure and the sliding of said sliding tube is caused and in that a mechanically linked opening means is provided between the said sliding tube and the said control device in the upper zone of the tank for opening of the flow of liquid in such a manner that the movements of the sliding tube are caused to determine the opening of the flow.

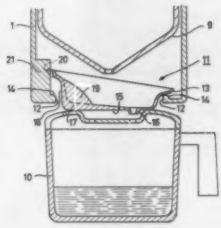
4,174,006

FILTERING DEVICE

Hendrik Panneman, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,485
Claims priority, application Japan, Mar. 9, 1977, 52/24925
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—87 **6 Claims**

1. A coffee maker comprising a housing in which a filter holder can be positioned, an opening in said housing beneath the position of the filter holder, said opening having an inwardly extending edge, a leak tray arranged underneath the filter holder position, said leak tray having an outwardly extending rim for resting on the inwardly extending edge of the housing opening, means to permit vertical movement of one portion of the leak tray rim with respect to the opposite portion of said rim, and a discharge outlet in said leak tray adjacent said opposite rim portion for the passage of filtrate into a collecting vessel arrangeable beneath and in contact with said leak tray, said one rim portion of the leak tray being vertically



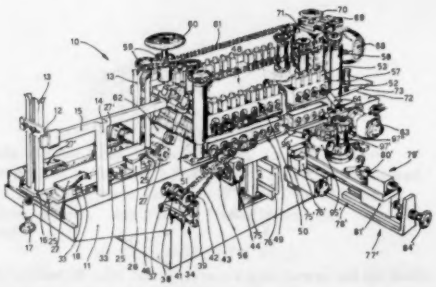
raised when the collecting vessel is in contact with the leak tray, said discharge outlet thereby being located at the lowest point of the bottom of said leak tray, and said one rim portion of the leak tray being vertically lowered when the collecting vessel is removed from contact with said leak tray, the bottom portion of the leak tray adjacent said one rim portion being thereby situated below the level of the discharge outlet.

4,174,007

MACHINE FOR THE PRODUCTION OF SHAPED PARTS

Renzo Novello, Manzano, and Elvio Bottussi, Medeuzza, both of Italy, assignors to Novello Fratelli S.p.A, Udine, Italy

Claims priority, application Italy, Jul. 15, 1975, 83407 A/75
Continuation-in-part of Ser. No. 705,152, Jul. 14, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,598
Int. Cl.[2] B27C *9/04, 5/00*
U.S. Cl. 144—1 R **11 Claims**



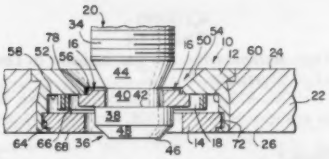
1. A machine for the production of shaped parts by means of material removing tools, said machine comprising in combination a one-directional entraining, guiding and processing bench having drive means thereon for driving said parts longitudinally along the longitudinal axis thereof; indexing means for controlling at least one of said material removing tools for movement at right angles to said longitudinal axis into and out of engagement with said parts; planing and grooving tool means positioned at the entry to said bench; loading means for feeding said parts to said planing and grooving means; and planing means at the exit of said bench for planing said parts prior to exit from the machine.

4,174,008

ACCESS PANEL FASTENER RETAINER

Joseph R. Preziosi, Clark, and Paul A. Trimmer, Berkeley Heights, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 28, 1977, Ser. No. 865,027
Int. Cl.[2] F16B *43/00*
U.S. Cl. 151—69 **10 Claims**



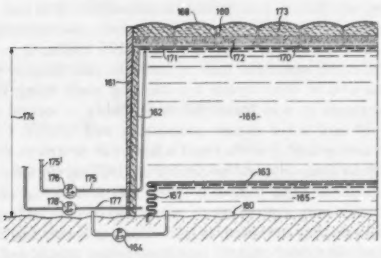
1. A retainer for use as a component of an access panel fastener for securing a panel to a structure, said retainer comprising a grommet having first and second axial ends and an axial aperture in open communication with each said end and adapted to capture a bolt inserted into said first end, said grommet having a radial shoulder surface facing away from said first end and defining a portion of said aperture and an internal surface extending toward said first end from and intersecting said shoulder surface at the radially inward edge thereof and defining a further portion of said aperture, only two discrete retaining jaws in said aperture, each said jaw having a first face confronting and overlapping said radial shoulder surface and a second face facing away from said first face and a boss extending toward said first grommet end from said first face, said boss adapted to pass the radially inward edge of said radial shoulder surface to enter said internal surface of said grommet when force is applied to said jaws tending to move the same toward said first grommet end when said jaws are in the radially innermost positions thereof; and spring means resiliently biasing each said jaw radially inwardly toward the grommet axis, each said jaw being C-shaped and substantially 180° in circumferential extent.

4,174,009

LONG-PERIOD THERMAL STORAGE ACCUMULATORS

Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener weg 35-37, 7141 Aldingen bei Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 616,256, Sep. 24, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 860,191
Claims priority, application Austria, Sep. 30, 1974, 7858/74; Nov. 20, 1974, 99290; Apr. 30, 1975, 13312
Int. Cl.[2] F28D *1/00;* F01K *3/00*
U.S. Cl. 165—45 **19 Claims**



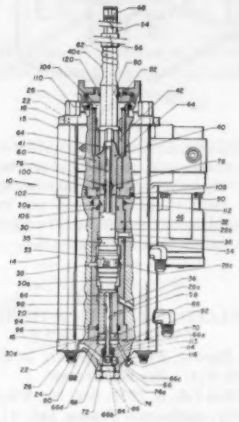
1. A long-period heat storage accumulator comprising a wall structure for containing a large volume of hot water within the accumulator interior and having means for filling and removing hot water therefrom, the improvement comprising in that the wall structure comprises in part a flexible covering including tensioning ropes for holding said covering against vertical movement and in that said accumulator is adapted to be completely submerged in water whereby the pressure of the hot water exerting forces on said wall structure is counteracted in part by the pressure of the water exterior of the accumulator exerting forces on the wall structure.

4,174,010

ROCK DRILL

George A. Hibbard, Claremont, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 625,540, Oct. 24, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,597
Int. Cl.[2] E21C *7/10*
U.S. Cl. 173—78 **12 Claims**



1. A fluid motor comprising: a body member; an elongated piston axially reciprocally movable within said body member; said body member including motive fluid conducting means cooperable with a source of motive fluid flow for conducting motive fluid to said piston to reciprocally drive said piston; elongated fluid conveying means extending within said body member and said piston; a sealed containment means defined within said motor and adapted to contain therein a quantity of heat transfer medium in isolation from said motive fluid conducting means; said containment means including a pair of variable volume chambers and passageway means communicating between said pair of variable volume chambers; said passageway means including a passage portion extending within said piston such that the heat transfer medium contained in said passage portion is maintained in heat exchange relation with said fluid conveying means; and said piston including means effective to induce a flow of such heat transfer medium within said passage portion during the reciprocal movement of said piston by increasing the volume of one of said variable volume chambers while decreasing the volume of the other of said variable volume chambers.

4,174,011

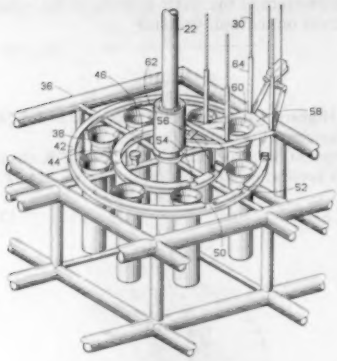
SUBSEA DRILLING TEMPLATE WITH CAROUSEL GUIDANCE SYSTEM

Hubart B. Zaremba, London, England, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,141
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 **8 Claims**

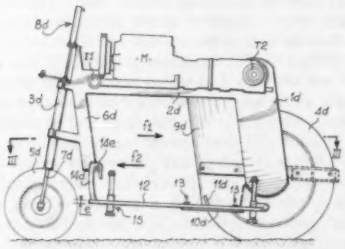
3. A sea floor template for use with a guidance system for drilling underwater wells from a floating vessel which comprises:

a template frame,
a group of well slots arranged in a circle and supported by said template frame,
an outer guide rail and an inner guide rail supported by said template frame and extending adjacent said circle of well



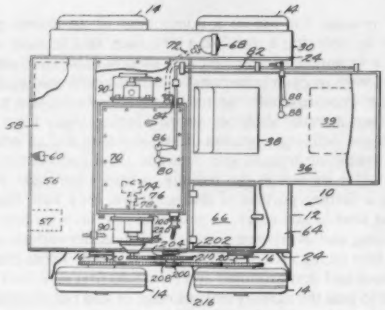
slots, said guide rails being concentric with each other and with said circle, said guide rails are in the form of an I-beam having an upper flat rim extending on either side of a vertical support member, said rim being cut in two places on said outer guide rail and two places on said inner guide rail, defining a quadrant.

4,174,012
SELF-PROPELLED UNIT WITH A HIGH-CLEARANCE CHASSIS VEHICLE
Emile Bobard, Beaune, France, assignor to Emile Bobard and Jeune Bobard (S.A.), Beaune, France
Filed Feb. 8, 1978, Ser. No. 876,088
Claims priority, application France, Feb. 11, 1977, 77 04044
Int. Cl.[2] B60P *1/02*
U.S. Cl. 180—313 **9 Claims**



1. A self-propelling device comprising
(a) a self-propelling vehicle having a high clearance chassis, drive wheels having pneumatic tires, steering wheels and lateral supports rigidly affixed to the lower portions of said chassis;
(b) a work-facilitating element adapted to fit within the transverse clearance of said vehicle and provided with supports cooperating with said vehicle supports and with means for permitting its positioning in contact with the ground, said element comprising a plate-like structure of sufficient length and rigidity to assure the bracing of said lower portions of said chassis, whereby traction effort can be supported;
(c) means on said device for relative vertical displacement between said vehicle supports and said element, whereby said vehicle supports may be uncoupled for disengagement of said element after it contacts the ground in order to permit longitudinal displacement of said vehicle, said means for relative vertical displacement comprising a system of circuits mounted on said vehicle, and including conventional means for adjustment, at least upon stoppage, of the pressure in the pneumatic tires at least of said drive wheels and of the elevation of suspension of said chassis on said steering wheels, whereby height displacements of said chassis are facilitated due to ground contact of the wheels of said vehicle.

4,174,013
MINE CAR
Jeffry R. Yago, Barboursville, W. Va., assignor to Lester Construction Co., Hurricane, W. Va.
Division of Ser. No. 678,631, Apr. 20, 1976, Pat. No. 4,094,361.
This application May 9, 1978, Ser. No. 904,296
Int. Cl.[2] B62D *11/12*
U.S. Cl. 180—6.2 **5 Claims**



5. A mine car comprising a vehicle body, an explosion-proof container mounted on said body, said explosion-proof container housing a motor, a plurality of wheels rotatably mounted to said body, drive means connecting said motor to said plurality of wheels, said drive means including a pair of first permissible assemblies, each of said first permissible assemblies being mounted, respectively to an explosion-proof container wall, each of said first permissible assemblies comprising an adapter plate which is secured to the explosion-proof container, said adapter plate having a central through-going stepped bore and shoulders defined at both ends of the central bore by said steps, said shoulders providing a seat for ball bearing races mounted therein and forming a flame baffle, a torque transmitting shaft mounted in and extending through said bore and said bearing races and adapted to rotate freely therein, the proximal end of said torque transmitting shaft being operatively engaged to a coupling means which couples said torque transmitting shaft to said motor, so that said torque transmitting shaft rotates when driven by said motor, transmission means mounted to said mine car outside of said explosion-proof container, said transmission means comprising a transmission assembly mounted to said explosion-proof container wall adjacent to said adapter plate, the distal end of said torque transmitting shaft being operatively engaged to said transmission assembly, a second drive portion of said drive means connecting said wheels to said transmission assembly so that said wheels can be driven by said transmission assembly, and means for controlling the speed and direction of the mine car, said speed and directional control means comprising a plurality of speed and directional control members movably mounted on said mine car body, one of said speed and direction control members being connected by a transmission assembly mounted on said mine car on the right hand side of said explosion-proof container and one of said speed and directional control members being connected to a transmission assembly mounted on a mine car on the left hand side of said explosion-proof container, each of said speed and

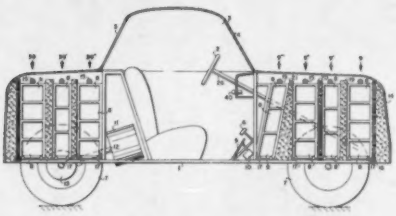
directional control members controlling its respective transmission assembly so that those wheels connected to the transmission assembly can be placed in a selective drive mode chosen from a forward, neutral, reverse mode sequence independently of the mode selected for the other transmission assembly, and a power source mounted on said mine car, said power source being connected to said motor and adapted to operate said motor.

4,174,014

SHOCK ABSORBENT ELECTRIC VEHICLE AND BATTERIES

Johan A. Bjorksten, P.O. Box 9444, Madison, Wis. 53715

Continuation of Ser. No. 645,249, Dec. 29, 1975, abandoned.
This application Oct. 7, 1977, Ser. No. 840,391
Int. Cl.[2] B60L *11/18*
U.S. Cl. 180—68.5 **1 Claim**



1. A wheeled land vehicle which is powered and driven by electricity comprising:
a passenger compartment,
a plurality of storage batteries,
a plurality of said storage batteries located between said passenger compartment and the front of said vehicle, and
a further plurality of said storage batteries located between said passenger compartment and the rear of said vehicle,
characterized by bodies of foam, said bodies of foam being disposed between at least some of said batteries,
at least some of said bodies of foam being disposed in spaced apart relationship longitudinally of said vehicle,
at least one battery disposed between each of said longitudinally spaced apart bodies,
each of said bodies extending transversely with respect to said vehicle.

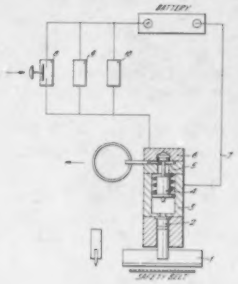
4,174,015

RESTRAINT SEVERING DEVICE

Michel Farcinade, Rue des delices, 19, Geneva, Switzerland

Filed Mar. 6, 1978, Ser. No. 883,754
Claims priority, application Switzerland, Mar. 7, 1977, 2977/77
Int. Cl.[2] B60R *21/10*
U.S. Cl. 180—268 **12 Claims**

1. A restraint severing device which includes: shearing means, retaining means arranged to hold said shearing means in operative proximity to said restraint, energy storing means arranged so that release of the stored energy will effect operation of said shearing means to sever said restraint, and means to provide a triggering signal to said energy storing means including at least one sensing means adapted to sense an abnormal situation, said means to provide a triggering signal further including a striker means within a bore, a cocked spring means to propel said striker along said bore toward said energy storing means and thereby release said stored energy upon contact with said energy storage means, and a fusible wire for holding said spring means in its cocked position but for being severed



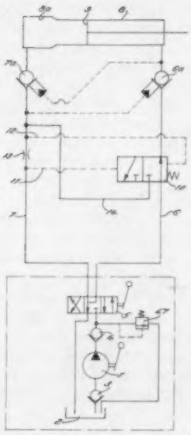
in response to said sensing means sensing said abnormal situation to thereby release said spring to propel said striker.

4,174,016

HYDRAULIC CAB TILTING SYSTEMS

Henry J. Levington, and James G. Knowles, both of Lincoln, England, assignors to Clayton Dewandre Company Limited, Lincoln, England

Filed Apr. 11, 1977, Ser. No. 786,541
Claims priority, application United Kingdom, May 3, 1976, 17934/76
Int. Cl.[2] B62D *33/06*
U.S. Cl. 180—89.15 **8 Claims**



1. In a hydraulic ram system incorporating a cylinder and piston assembly for tilting the cab of a commercial vehicle, which cab is resiliently mounted on the vehicle frame or chassis, wherein the end of the ram cylinder in which the ram piston is located when the cab is in the lowered position is of increased bore diameter to provide enough clearance around the piston to render the ram passive in this position, the length of the increased cylinder bore being sufficient to accommodate the maximum movement of the cab on its suspension, and wherein a lower fluid conducting ram line is connected to the increased bore end of said ram cylinder and an upper fluid conducting ram line is connected to the other end of said ram cylinder; the improvement wherein there is provided in the lower ram line a restriction such that when fluid is pumped through said line to raise the load a pressure drop is created across the restriction, and there is provided in the upper ram

line valve means operatively connected to be responsive to the pressure differential across said restriction and operable thereby to connect the upper ram line to the lower ram line.

4,174,017

VEHICLE POWER ASSISTED STEERING APPARATUS

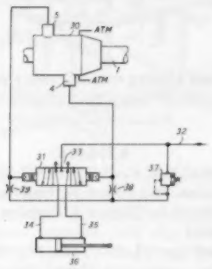
Peter D. Morgan, Clutton, England, and Alistair G. Taig, South Bend, Ind., assignors to Bendix Westinghouse Limited, Bristol, England

Filed Jan. 28, 1978, Ser. No. 872,273

Claims priority, application United Kingdom, Jan. 29, 1977, 3725/77

Int. Cl.[2] B62D *5/08*

U.S. Cl. 180—132 **1 Claim**



1. In a steering system having a rotatable input member coupled to a rotatable output member, the input member and output member cooperating to substantially define a sensor, a relay valve communicating pressurized air to atmosphere via the sensor, the relay valve also communicating with an actuator which is engageable with a linkage member in the steering system, the input member being rotatable relative to the output member to vary communication of pressurized air via the sensor, the relay valve being movable in response to the variation of pressurized air communication from a neutral position to an unbalanced position, the relay valve communicating pressurized air to the actuator in the unbalanced position to move the linkage of the steering system, the sensor comprising a first space and a second space on the output member and a first lug and a second lug on the input member extending into the first and second spaces, respectively, a first inlet port communicating via a first set of passages within the output member with the first and second spaces, and a second inlet port communicating via a second set of passages within the output member with the first and second spaces, the first and second spaces opening to atmosphere and the first and second lugs being movable within the first and second spaces, respectively, in order to vary communication through the spaces to atmosphere when the input member is rotatable relative to the output member.

4,174,018

ARRANGEMENT FOR CONTROL OF TWO HYDRAULIC PRESSURE SYSTEMS, INCLUDING BOOSTER STEERING CONTROL

Karl-Heinz Liebert, Schwaebisch Gmuend, and Werner Tischer, Böbingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

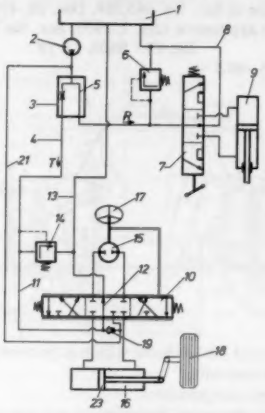
Filed Jun. 28, 1978, Ser. No. 920,059

Int. Cl.[2] B62D *5/08*

U.S. Cl. 180—132 **2 Claims**

1. In a dual control hydraulic system having a common pump for pressurizing power cylinders of a booster steering hydraulic circuit and an accessory operating hydraulic circuit via a multiway steering control valve for steering control and accessory control valve for accessory operation, and including a tank and flow connecting means intermediate said tank and said pump and said multiway valves and said power cylinders whereby selective actuation of said multiway valves pressurizes and exhausts respective power cylinders and wherein said booster steering hydraulic circuit also has a constant flow device (3) connected intermediate said pump and the steering control valve (10) effecting a substantially constant flow available for power steering and wherein said system has connection means (4, 11) from said constant flow device (3) to said steering control valve (10) for said constant flow thereto;

the improvement wherein said flow connecting means comprises a first branch connection (21) for pump output, upstream of said constant flow device, to said steering control valve (10); and a second branch connection (5) for pump output, upstream of said constant flow device, to the accessory control valve (7);



wherein said minimal flow is shunted to said tank through said steering control valve (10) in neutral position thereof while flow from said first branch connection (21) is blocked thereat at that time;

and flow combining means (19) effecting combined flow from said first branch connection (21) to said flow connection means (4, 11) when said steering control valve (10) is operated for effecting steering control to provide combined flow therethrough to the power cylinder (16) of said steering hydraulic circuit;

and wherein use of accessory power during steering effects flow from said first branch connection (21) to said second branch connection (5) causing reduction of flow from said first branch connection (21) to said steering control valve, steering power being effected by said constant flow combined with flow from said first branch connection (21) passes to said second branch connection (5).

4,174,019

DUAL SPEAKER

Justin A. Kramer, 10 28 W. 8th Pl., Los Angeles, Calif. 90017

Filed Mar. 20, 1978, Ser. No. 888,200

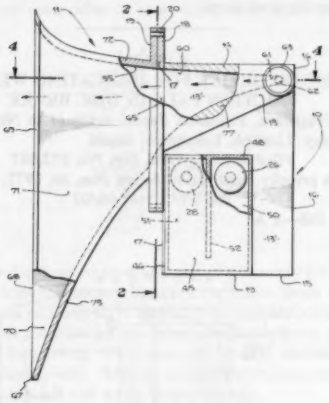
Int. Cl.[2] G10K *13/00;* **H04R** *7/00;* **G10K** *11/00*

U.S. Cl. 181—159 **9 Claims**

1. A dual speaker for emitting sounds originating in an electronic circuit comprising a housing, a side wall structure, a rear wall structure and an output wall structure,

a low frequency driver chamber for reception of a low frequency driver unit, a low frequency outlet opening adjacent the output wall structure for emission of low frequency sounds, and a relatively long circuitous low frequency horn from the low frequency driver chamber to the low frequency outlet opening and forming a clear passage therethrough for sound, a high frequency driver

chamber for reception of a high frequency driver unit, a high frequency outlet opening adjacent the output wall structure for emission of high frequency sounds and a relatively short direct high frequency horn from the high



frequency driver chamber to the high frequency outlet opening and forming a clear passage therethrough for sound, there being a common partition between said horns, said outlet openings being in relatively the same plane.

4,174,020

ACOUSTIC TREATMENT FOR FANS

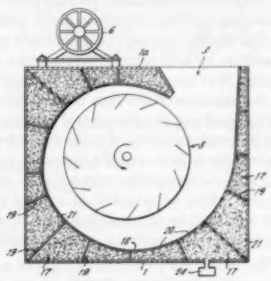
Louis A. Challis, 158 Queen St., Woollahra 2025, New South Wales, Australia

Filed Jun. 14, 1976, Ser. No. 695,622

Claims priority, application Australia, Jul. 1, 1975, PC2191; Aug. 13, 1975, PC2790

Int. Cl.[2] **F01N** *3/06, 1/04;* **G10K** *11/04;* **F01D** *5/10*

U.S. Cl. 181—211 **13 Claims**



1. A centrifugal fan equipped with apparatus for attenuating noise generated thereby, the apparatus comprising:

(a) a rigid backing member having at least one planar surface,

(b) a curved scroll mounted in spaced disposition from said rigid backing member and having a plurality of acoustically permeable zones, each containing a multiplicity of small perforations and being of strip-like shape extending substantially parallel to the axis of the fan over substantially the entire width of the scroll in the direction parallel to said axis, said zones being separated by unperforated zones of the scroll, and

(c) wall means secured to the scroll in the unperforated zones thereof and dividing the space between said scroll and backing member into a plurality of Helmholtz acoustic absorption cavities containing sound absorbing material and dimensioned to have different respective resonant frequencies whereby the noise of the fan is transmitted by said scroll and attenuated in said cavities over a wide range of frequencies, at least two of said Helmholtz cavities being formed between the scroll and said planar surface, and said scroll being so disposed relative to the planar surface that the two cavities are of different depths.

4,174,021

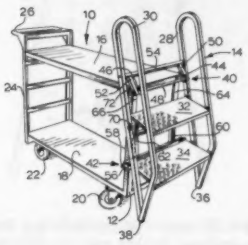
LADDER TRUCK

Norman A. Barlock, Oakville, Canada, assignor to Alnor Material Handling Limited, Canada

Filed May 16, 1978, Ser. No. 906,694

Int. Cl.[2] **E06C** *5/02;* **B62B** *5/04*

U.S. Cl. 182—17 **5 Claims**



1. A ladder truck comprising:

a truck portion having first and second supporting wheel formations near opposed ends thereof, on which the ladder truck may be rolled across a surface;

a step ladder movably secured to the truck portion at the first end thereof and having a single pair of downwardly extending surface engaging extremities;

a pair of pivot arms pivotally connected at one end to the upper part of the first end of the truck portion and pivotally connected at the other end to an upper portion of the step ladder;

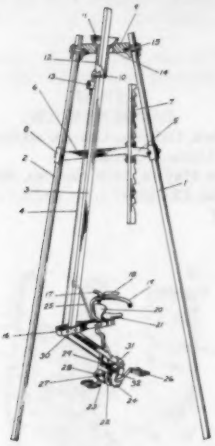
said step ladder being movable relative to the truck portion by pivoting movement of said pivot arms in a vertical plane relative to both the truck portion and the step ladder, between:

a first position in which the step ladder is supported by the truck portion with its downwardly extending extremities clear of the surface on which said wheel formations rest, so as to permit the ladder truck to be rolled across the surface on its wheeled formations, the pivot arms in said first position extending from their connection to the end of the truck portion to their connection to the step ladder in a direction upwardly and rearwardly towards the centre of the truck portion;

an intermediate portion in which the pair of downwardly-extending extremities of the step ladder, and each of the supporting wheel formations, rest on said surface, the pivot arms in said intermediate position extending outwardly in a direction away from the truck portion;

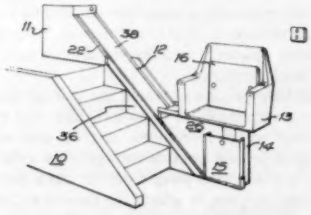
and a second position in which the downwardly-extending extremeties of the step ladder engage the surface and support a portion of the weight of the ladder truck thereon, with the first said supporting wheel formations raised out of engagement with the surface, the pivot arms in said second position extending from their connection to the end of the truck portion to their connection to the step ladder in a direction downwardly and rearwardly towards the centre of the truck.

4,174,022
ORCHARD LIFTS
W. Henry Snyder, c/o Zion's Mtn. View Nursing Home, 2730 E. 33rd St., Salt Lake City, Utah 84109
Filed Feb. 14, 1977, Ser. No. 768,108
Int. Cl.[2] A01D *46/20, 46/24*
U.S. Cl. 182—145 **1 Claim**



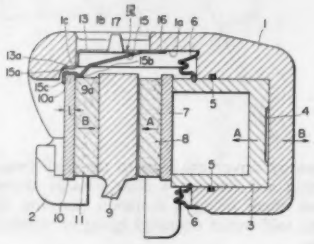
1. An orchard lift apparatus, including a bicycle-type seat upon which an orchard worker may sit, said seat mounted on an elongated pole passing upward through a sleeve and friction hemisphere or partial hemisphere, said hemisphere resting within a socketed bridge through which said sleeve passes downward, a cable attached to said sleeve-hemisphere unit, extending downward, and wound or unwound by the worker on a drum, at the bottom of said elongated pole, by means of foot pedals whereby the worker may move upward or downward, two straight poles or tubes constituting the legs, angling inward in an upward direction, the above mentioned socketed bridge rigidly fastened to, and spanning across the tops of said pole legs, support means, attached to the upper portion of said apparatus, for holding the apparatus upright.

4,174,023
STAIRLIFT
Stephen J. Dooley, 112 Sewerby Rd., Bridlington, North Humberside, Y016 5UP, England
Filed Nov. 8, 1977, Ser. No. 849,583
Int. Cl.[2] B66B *9/08*
U.S. Cl. 187—12 **6 Claims**



1. A stair lift comprising a load bearing part, a guide rail for extending up one side of a stair way and, for guiding the load bearing part, a lead screw in the guide rail having a plurality of differently inclined sections, at least one spring for connecting adjacent screw sections, the coils of the spring being continuous with the screw thread for maintaining the pitch of the thread, and a corresponding threaded part attached to the load bearing part for co-operation with the lead screw, and means for rotating the lead screw whereby the threaded part and thus the load bearing part can be traversed along the guide rail, and wherein the lead screw is seated on a strip extending longitudinally of the guide rail having a semicircular cross-sectioned recess for the lead screw.

4,174,024
WARNING DEVICE FOR INDICATING WEAR OF FRICTION PADS IN DISC BRAKE
Yutaca Hagiwara, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Jan. 26, 1978, Ser. No. 872,652
Claims priority, application Japan, Jan. 26, 1977, 52-7281[U]
Int. Cl.[2] F16D *66/02*
U.S. Cl. 188—1 A **3 Claims**

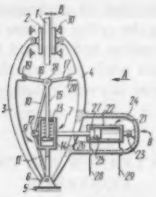


1. A disc brake comprising:
a friction disc capable of rotation with an element to be braked;
a yoke straddling said disc and provided with a piston reciprocative axially with respect to said disc;
first and second opposed backing plates respectively urgeable by said piston and said yoke toward the two opposite faces of said disc;
first and second friction pads respectively carried on the opposing faces of said first and second backing plates; and
a friction pad wear sensor mounted on said yoke and having a resilient tongue portion diverging from said yoke, said tongue portion having an acute bend portion adjacent to a peripheral surface of said second friction pad, said tongue portion coming first into contact with an edge of said disc defined by the junction of the face of said disc facing said second friction pad and the peripheral surface of said disc at a first predetermined level of wear of said second friction pad, whereby a first audible signal is generated by said sensor, and subsequently coming into contact with the peripheral surface of said disc at a point spaced from said edge at a second predetermined level of wear of said second friction pad, whereby a second audible signal is generated by said sensor.

4,174,025
PIVOTED LEVER BRAKE STRUCTURE
Leonid M. Ivachev, ulitsa Sovetskaya, 80, kv. 8, Tolyatti Kuibyshevskoi oblasti, U.S.S.R.
Filed Aug. 11, 1977, Ser. No. 823,860
Int. Cl.[2] F16D *55/26*
U.S. Cl. 188—72.6 **4 Claims**

1. A braking gear comprising, two symmetrical arcuate brake levers pivoted at one end about a common pivot point and symmetrically disposed about an axis of symmetry passing through said common pivot point, two brake shoes each mounted on a free end of a respective one of said arcuate brke levers, each said free end being spaced from said common pivot point, a toggle system having two levers each pivotally connected to a corresponding arcuate brake lever and pivotally connected at a pivot at one end on said axis of symmetry,

and having a third lever disposed along said axis of symmetry connected at the last-mentioned pivot and disposed extending axially between the arcuate brake levers, means to actuate said third lever axially to move said pivot of said two levers along the axis of symmetry to move the free ends of the arcuate levers toward each other or away from each other to thereby



move the brake shoes toward said axis of symmetry for braking a moving element disposed between the brake shoes or away from said axis of symmetry, and fluid-actuated, double-acting means to additionally vary the distance between pivot points at which said two levers are connected to said arcuate levers thereby to additionally variably control the movement of said brake shoes toward and away from said axis.

4,174,026

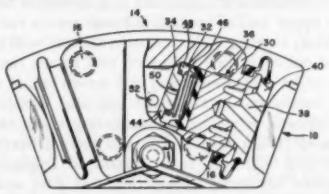
DASH POT FOR A HYDRAULIC ACTUATOR FOR A DRUM BRAKE

Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 833,531, Sep. 15, 1977, abandoned. This application Oct. 30, 1978, Ser. No. 956,120

Int. Cl.[2] B60T *11/10*

U.S. Cl. 188—361 **1 Claim**



1. In a hydraulic actuator having a housing communicating pressurized fluid to a stepped bore therein via an inlet and a piston slidably disposed within the stepped bore engaging a brake shoe for urging the brake shoe from a normal position to a braking position when the pressure communicated to the bore is above a predetermined value, the improvement in which a partition is movably disposed within the stepped bore, said partition being connected to the piston by resilient means and being movable within the stepped bore in response to pressurized fluid therein for transmitting the force created by the pressurized fluid within the stepped bore during braking to the piston, said partition being biased by said resilient means into engagement with a shoulder defined by the stepped bore and also cooperating with said piston to substantially define a secondary chamber communicating with the inlet via a restrictive passage substantially defined by said partition, the piston including a portion in abutment with the housing when the brake shoe is in the normal position, the fluid pressure within the secondary chamber increasing as the brake shoe moves from the braking position to the normal position and the partition is in engagement with the shoulder, and said partition regulating reduction of the increased fluid pressure in the secondary chamber as the brake shoe moves from the braking position to the normal position in order to provide for gradual retraction of said piston portion into abutment with the housing, so as to substantially eliminate noise when the piston portion abuts the housing.

4,174,027

EXHAUST GAS RECIRCULATION APPARATUS CONTROLLED BY CLUTCH, THROTTLE AND TIMER

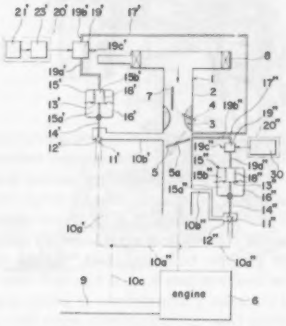
Tadataka Nakazumi, Kure, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Oct. 27, 1977, Ser. No. 846,494

Claims priority, application Japan, Nov. 5, 1976, 51/133441

Int. Cl.[2] F02M *25/06;* **F02B** *33/00*

U.S. Cl. 192—0.084 **9 Claims**



1. An exhaust gas recirculating apparatus for an internal combustion engine provided with a transmission to be operated by a clutch and having a throttle valve controlling flow through a carburetor induction passage and a duct connecting the exhaust gases to the engine intake manifold with a flow control valve normally closing the duct to prevent recirculation and movable to an open position by a signal applied thereto, comprising a device for detecting the actuation of said clutch, a device for detecting the opening of said throttle valve to be reached to the extent above a predetermined degree of opening, and a timer to be actuated for a presetting period, said flow control valve being moved to open by signals from both of said devices and kept opening by signal from said timer.

4,174,028

METHOD AND APPARATUS FOR ORIENTING AND STORING SIMILAR ARTICLES

Gerald Barnes, South Orange, N.J., assignor to Amerace Corporation, New York, N.Y.

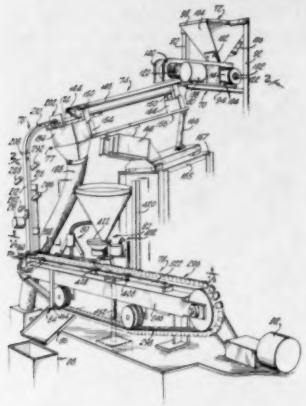
Continuation of Ser. No. 479,255, Jun. 13, 1974, abandoned, which is a division of Ser. No. 270,191, Jul. 10, 1972, Pat. No. 3,831,736, which is a division of Ser. No. 30,817, Apr. 22, 1970, abandoned, which is a continuation of Ser. No. 605,769, Dec. 29, 1966, abandoned. This application May 12, 1978, Ser. No. 905,464

Int. Cl.[2] B65G *47/44*

U.S. Cl. 198—389 **4 Claims**

1. Apparatus for storing similar screws each having a shank and at one end thereof a head of greater transverse dimension than said shank and delivering said screws one at a time to screw receiving, positioning and carrying means moving in a predetermined direction on a predetermined horizontal path, said apparatus comprising an elongated stacking track having a smooth longitudinal aperture of substantially constant cross sectional shape and no abrupt changes in direction, said aperture including a wide portion to receive the heads of said screws in abutting relation and a narrow portion to receive the shanks of said screws in spaced parallel relation, said track and said aperture having a straight lower portion of a length equal to at least several times said transverse head dimension and terminating at a lower screw discharge end located above said path, said aperture in said lower portion thereof being so ori-

ented that the axes of the screws therein will be horizontal and crosswise of said path, and the longitudinal center line of said aperture in said lower portion making an angle with the vertical, such that a screw in said lower portion will tend to push a screw beneath it in said predetermined direction, said track and said aperture at said discharge end defining a lateral opening facing said predetermined direction for facilitating exiting of



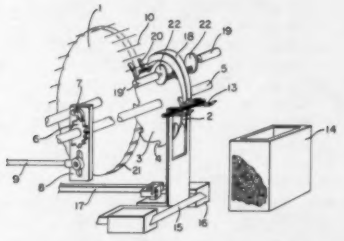
said screws, and wherein a feed control plate is pivotally mounted on said track adjacent said lateral opening and is resiliently deflectable by the shank of each said screw as it exits through said opening, whereby said feed control plate urges each of said discharged screws into article receiving position on said receiving, positioning and carrying means for movement in said predetermined direction along said path.

4,174,029

DEVICE FOR SUPPLYING LINEAR MATERIALS

Hikotarou Kawaguchi, Sakura, and Hisawo Kobayashi, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,148
Claims priority, application Japan, Jul. 25, 1977, 52/99114
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—431 **6 Claims**



1. An apparatus for supplying linear objects, comprising:

a processing drum mounted for rotation about a horizontal axis, said processing drum having a series of circumferentially spaced grooves on its periphery for holding linear objects in horizontal positions during processing thereof;

a transfer drum mounted for rotation about a horizontal axis and means for effecting intermittent stepwise rotation of said transfer drum, said transfer drum having a series of circumferentially spaced slots on its periphery for receiving and holding a group of the linear objects in each slot, said transfer drum having a circumferentially extending recess in its periphery and said drums being arranged so that a portion of said processing drum extends into said recess so that the paths of travel of said grooves and slots intersect whereby the linear objects are transferred from said grooves to said slots; and

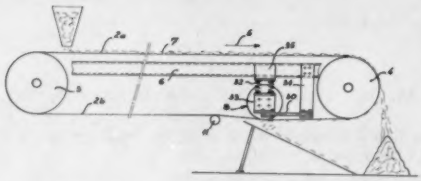
a reciprocable pusher having a sidewardly opening channel-shaped cavity for receiving linear objects therein, said pusher being mounted in association with said transfer drum for pushing the group of linear objects out of each of the slots in succession and beyond the circumference of said transfer drum while said transfer drum is stationary during intermittent stepwise rotation thereof.

4,174,030

VIBRATORY CLEANER FOR ENDLESS BELT CONVEYOR

Daniel Philibert, 152 rue Francois Frandaz, 38290 La Verpilliere, France

Filed Mar. 29, 1978, Ser. No. 891,387
Claims priority, application France, Apr. 26, 1977, 77 13613
Int. Cl.[2] B65G *45/60*
U.S. Cl. 198—494 **7 Claims**



1. An endless belt conveyor comprising frame means, conveyor belt means, first and second guide roller means carried by said frame means and supporting said conveyor belt means to have an upper carrier run and a lower return run thereof, vibrating freely rotating roller means in contact with the inside face of said conveyor belt means on said return run thereof, supporting roller means engaging said return run of said conveyor belt means and located such that said vibrating roller means is disposed between said supporting roller means and said first guide roller means, first and second bearer means supporting said vibrating roller means at respective ends thereof, means resiliently connecting said first and second bearer means to said frame means, vibration generator motor means disposed within said vibrating roller means and having a stator connected to said first and second bearer means, and means sealing said vibrating roller means against access of dirt to said vibration generator motor means, wherein said first and second bearer means each comprise a bearing having an inner race and an outer race, wherein said stator means of said vibration generator motor means includes first and second cylindrical journal pins engaged in the respective bearings of said first and second bearer means, and wherein said first and second bearer means each further include (a) respective end cover means and means for connecting said end cover means to the respective one of said first and second journal pins and (b) respective abutment means carried by said vibrating roller means for preventing axially inward movement of said bearing with respect to said vibrating roller means by engaging the outer race of said bearing.

4,174,031

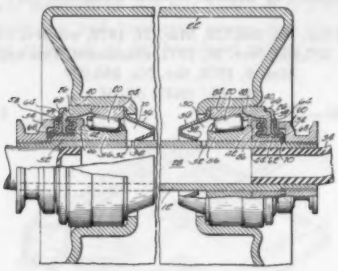
LUBRICATING SYSTEM AND METHOD

Donald R. MacLeod, Ottawa, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Mar. 27, 1978, Ser. No. 890,737
Int. Cl.[2] B65G *45/02*; F16N *7/24*
U.S. Cl. 198—501 **10 Claims**

1. The combination with a belt conveyor idler assembly having at least one shaft with an axial bore supported on bear-

ings, a seal adjacent the bearings providing a passage for the flow of lubricant therethrough, a lubrication fitting at one end of the shaft communicating with the shaft bore for supplying lubricant under pressure to the shaft bore from a pressurized source of lubricant which engages the lubrication fitting, wherein the improvement comprises:



small holes through the walls of the shaft for providing lubricant to flow therethrough from the bore to the bearing so that the lubricant pressure drop through the shaft bore is negligible in comparison to the pressure drop through said holes; said holes having a diameter equal to or less than 0.052 inch; and

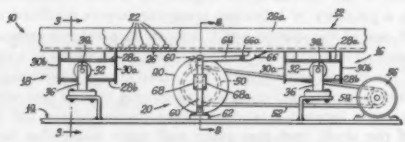
means for sealing the shaft bore against flow of lubricant except through said holes.

4,174,032

SHAKER CONVEYOR DRIVE MECHANISM

Charles L. Watkins, Chicago, Ill., assignor to Goodman Equipment Corporation, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,881
Int. Cl.[2] B65G *27/00*
U.S. Cl. 198—761 **6 Claims**



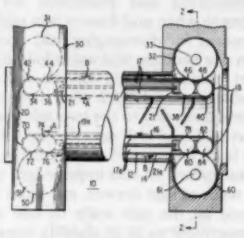
1. A shaker conveyor drive for use in effecting longitudinal reciprocating movement of a conveyor trough supported in fixed guideways so as to be movable only longitudinally, said conveyor drive comprising, in combination, a flywheel, means supporting said flywheel for rotation about a first axis of rotation, a lever arm, means supporting said lever arm at one end thereof for pivotal movement about a pivot axis transverse to said lever arm and spaced from said first axis of rotation, a slide block carried by said lever arm for movement longitudinally along said lever arm, said flywheel having a plurality of openings therein spaced circumferentially about its axis of rotation at different radial distances from said axis of rotation, said slide block having a connecting stub shaft thereon adapted for selective cooperation with said openings in said flywheel eccentric to the axis of rotation thereof, said lever arm being pivotally connected at its opposite end to said conveyor trough at a position spaced from said pivot axis, and means for effecting constant speed rotation of said drive member so as to effect reciprocal pivotal movement of said lever arm about its said pivot axis to reciprocate the conveyor trough with movement thereof in a first direction having greater acceleration than movement thereof in an opposite direction, the movement characteristics of said conveyor trough being variable in relation to connection of said slide block to different ones of said openings.

4,174,033

DOUBLE WALLED ROTARY TUBULAR CONVEYOR

Ronald Parsons, 15 Fieldhedge Dr., Hillsborough, N.J. 08876

Filed Aug. 12, 1977, Ser. No. 823,948
Int. Cl.[2] B65G *17/00*
U.S. Cl. 198—804 **12 Claims**



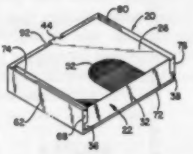
1. In a conveying device the combination comprising: a first flexible member having an inside surface, an outside surface and first and second end portions; said first and second end portions each have a generally annular shape about an orifice to form respectively an inlet and an outlet; first drive and support means disposed intermediate said flexible tube inside and outside surface; said drive and support means disposed relative to said first and second end portions to maintain said inlet and said outlet at a substantially constant separation and orientation with respect to each other; said drive means operative to propel said flexible member in a continuous closed loop such that said inside surface becomes said outside surface and said outside surface becomes said inside surface; and, said flexible member inside surface being a closed substantially continuous surface open at said first and second end portions.

4,174,034

SAFETY CONTAINER HAVING A SLIDEABLE CLOSURE

William K. C. Hoo, 3 Sherwood Dr., Bedford, Mass. 01730

Continuation-in-part of Ser. No. 896,735, Apr. 17, 1978, abandoned. This application Jul. 10, 1978, Ser. No. 923,079
Int. Cl.[2] A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **22 Claims**



1. In a container comprising, in combination:

a cover including a substantially planar rectangular top having coupled to three edges thereof a rear wall and two side walls connected to said rear wall and a fourth edge so as to define with said two side walls an open front end;

a drawer including a substantially planar rectangular bottom of slightly smaller dimensions than said top, said bottom having connected to the four edges thereof a pair of side walls, a front wall connected to said side walls and a back wall connected to said side walls said side, front and back walls of said drawer having respective upper edges lying in a common plane;

said drawer being slidably engagable with said cover so that said drawer is movable between (1) a closed position wherein said drawer fits entirely within said cover and (2) an open position wherein said drawer is displaced from said rear wall of said cover and extends between the side

walls of said cover through said open front end of said cover;

latching means for securing said drawer within said cover in said closed position, said latching means comprising a hooked tongue and a latch, each being mounted on a respective one of the exterior surface of said back wall of said drawer and said rear wall of said cover, said latch being constructed and positioned for engaging said hooked tongue when said drawer is in said closed position;

unlatching means for disengaging said hooked tongue and latch from one another, said unlatching means including a slit formed in said rear wall, wherein said cover is made of a distortable material such that compressive pressure applied simultaneously to the two side walls of said cover will distort said rear wall adjacent said slit so as to disengage said latch from said hooked tongue; and

sealing means formed of said upper edges of the side, front and back walls of said drawer, and cams and cam followers disposed on the side walls of said drawer and said cover respectively so as to slidably engage one another, said cams and cam followers being dimensioned and positioned so as to resiliently urge said sealing means into tight sealing contact with the interior surface of said top as said drawer is moved toward said closed position.

4,174,035

TWO-COMPONENT CONTAINER AND PACKAGE

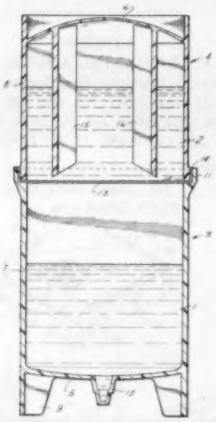
Georg Wiegner, Breslauer Str. 35, Viersen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 720,154, Sep. 30, 1976, Pat. No. 4,103,772. This application Jul. 13, 1978, Ser. No. 924,132

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539291

Int. Cl.[2] **B65D** *25/08*

U.S. Cl. 206—222 **9 Claims**



1. A container comprising:

(a) a first shell and a second shell,

(1) each shell being cup-shaped and having a bottom wall and an annular side wall transverse to said bottom wall,

(2) said walls bounding respective cavities in said shells;

(3) each side wall having an annular rim portion remote from the associated bottom wall and bounding a side of the cavity in the shell open toward the other shell;

(b) fastening means fixedly fastening the rim portions of said shells to each other, said fastening means consisting essentially of a frangible partition of sheet material having two opposite major faces separated by the thickness of said partition, said faces being fixedly fastened to said rim portions respectively and respectively sealing the open sides of said cavities from each other; and

(c) a piercing member mounted on the bottom wall of said first shell for movement transverse to said major faces into piercing engagement with said partition.

4,174,036

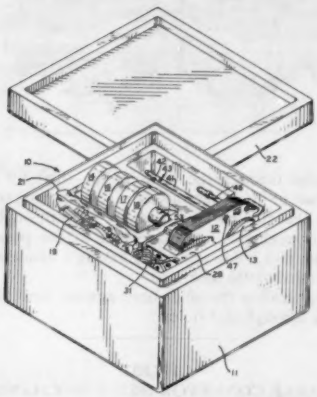
REPLACEMENT MOTOR KIT AND PARTS THEREOF

Daniel L. Beckman, and Earl D. Stauffer, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 560,729, Mar. 21, 1975, which is a division of Ser. No. 307,965, Nov. 20, 1972, abandoned. This application Mar. 9, 1978, Ser. No. 884,907

Int. Cl.[2] **B65D** *85/68*

U.S. Cl. 206—223 **8 Claims**



1. A replacement motor kit comprising an enclosure having a plurality of compartment means defining spaced apart regions therein for receiving electric motor components; a skeleton motor stator assembly and rotor assembly confined in a first one of the spaced apart regions by a first compartment means; a plurality of lubricant reservoir covers confined in a second one of the spaced apart regions by a second compartment means; and adapting instrumentalities confined in a third one of the spaced apart regions by a third compartment means; the rotor assembly including a shaft having at least one weakened section located a predetermined distance from the free end of the shaft, and the stator and rotor assemblies being permanently secured in aligned relationship; said lubricant reservoirs being of the quickly attachable type and each including means for latching such lubricant reservoir in assembled relationship with the stator and rotor assemblies.

4,174,037

SPACE-CONSERVING SKIN-PACKED ASSEMBLY

Kirk K. Chow, Dallas, Tex., assignor to National Hand Tool Corporation, Dallas, Tex.

Filed Jul. 27, 1978, Ser. No. 928,547

Int. Cl.[2] **B65D** *85/28*

U.S. Cl. 206—378 **7 Claims**

1. In the packaging of hardware items such as hand tools to house and display tools in a container such as a rigid tool box or carrying case, a space-conserving covered package assembly, said package assembly sized to fit within the tool box with peripheral borders of said package in close proximity to upstanding bounding walls of said tool box,

said package assembly comprising:

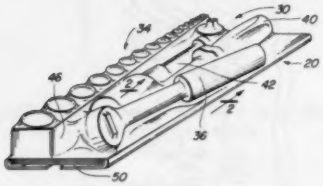
baseboard means of semi-rigid sheet stock for support of tool elements placed thereon,

the shape and areal configuration of said baseboard means being essentially congruous to a floor area of a case in which said package assembly is to be inserted,

floor sheet means for attachment of a tool retaining film

thereto, said floor sheet means extending laterally beyond said baseboard means at a pair of opposed parallel edges thereof to demark a pair of fold lines and to delineate a corresponding pair of flanges extending marginally along said floor means and outwardly of said opposed side edges of said baseboard means along the length thereof,

a plurality of tool elements arranged on said floor sheet means interiorly of said fold lines and in a zone corresponding to said baseboard means, said tool elements being supported on said baseboard means,



a cover film of transparent plastic superimposed on so as snugly to confine said tool elements for securing said tool elements fixed in place in said package assembly,

bonding means bonding said film to said flanges of said floor sheet means over a substantial surface area of said flanges,

said flanges with said film bonded thereto being folded under said baseboard means at said fold lines to lie contiguously against said baseboard means at an undersurface thereof,

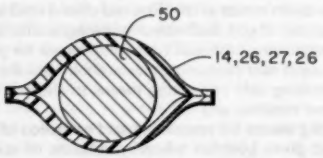
whereby substantially the entire floor area of the case is occupied by said tool elements to effect substantial conservation of space and to provide a pilfer-resistant display.

4,174,038

PACKAGE FOR PHOTOGRAPHIC FILM AND MATERIAL AND POWDERS FOR MAKING SAME

Philip C. Whiting, Jr., Holyoke, Mass., assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Mar. 7, 1977, Ser. No. 774,934
Int. Cl.² B65D *85/00*
U.S. Cl. 206—389 **14 Claims**



1. A heat-sealable, readily-tearable, opaque flexible packaging sheet material comprising a carbon containing polymeric ply on a paper substrate, the improvement wherein said carbon-containing polymeric ply is a co-extruded ply of polymer consisting of the following three co-extruded layers

(a) an outer layer of about 0.0005 inch thickness comprising 0 to 10 percent carbon black

(b) an interior layer having a thickness of about 0.5 mils comprising from about 15 to 25 percent carbon black

(c) adjacent said paper, another outer layer of about 0.0005 inch thickness comprising 0 to 10 percent carbon black

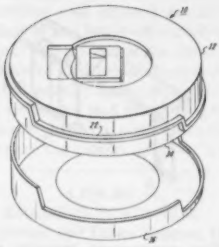
and wherein said co-extruded ply has a maximum thickness of about 2 mils in thickness.

4,174,039

RECORDING DISK CARTRIDGE

Michiel Frankhuizen, Martinez, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,653
Int. Cl.² B65D *21/04*; G11B *1/02*
U.S. Cl. 206—444 **11 Claims**



1. A recording disk cartridge comprising:

a housing in which at least one recording disk may be mounted for rotation about its axis, said housing having a peripheral side wall about which a ridge is formed, said ridge being defined by a plurality of sections at least some of which are spaced from one another in a direction parallel to the axis of rotation of a disk mounted in said housing, the dimensions and spacings of said sections being such that the contour of said peripheral side wall at the lower surface of said ridge is the substantial complement of the contour of said peripheral side wall at the upper surface of said ridge; and

a cover including a peripheral side wall having an upper surface that is contoured substantially the same as that of the peripheral side wall of said housing at the lower and upper surfaces of said ridge and having a maximum height only slightly greater than the maximum height of the peripheral side wall of the housing above and below said ridge, whereby said cover may be disposed over the lower end of said housing with the upper surface of the peripheral side wall of said cover seated against the lower surface of said ridge with only a slight increase in the height of the combined housing and cover relative to the housing alone, and whereby said cover may be disposed upside-down over the upper end of said housing with the upper surface of the peripheral side wall of said cover seated against the upper surface of said ridge with only a slight increase in the height of the combined housing and cover relative to the housing above.

4,174,040

MULTI-FUNCTIONAL SUPPOSITORY ENCAPSULATOR

Su-Yen Wang, 881, Section 1, Chung Shan Rd., Tachia Town, Taichung Hsien, Taiwan

Filed Dec. 2, 1977, Ser. No. 857,183
Int. Cl.² B65D *1/32*
U.S. Cl. 206—529 **5 Claims**

1. A multi-functional suppository encapsulator comprising:

an upwardly opening trough portion having a plurality of openings in the bottom thereof,

a plurality of bullet-shaped container portions extending down from said openings of said trough portion respectively and having converging nose portions, and

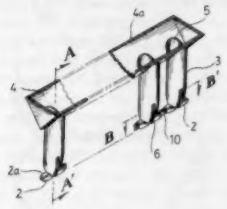
integral strips of material joining said nose portions of said container portions with one another, said strips being spaced from said trough portion,

said trough portion, said container portions and said strips being integrally formed of soft, resilient non-toxic material,

means defining separation lines extending transversely across said trough portion and said strips between said

container portions for separation of said encapsulator into units each comprising a container portion and an appurenant section of said trough portion, and

means defining rupture lines extending across the nose portions of said container portions to open said nose portions of container portions when ruptured for extrusion of a suppository therethrough,



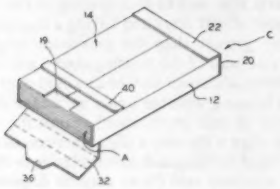
whereby molten suppository material poured into said trough portion flows into said container portions and solidifies therein to form suppositories, which, in use, are extruded through the ruptured nose portion of a container portion by application of digital pressure to said appurtenant section of said trough portion and an adjacent portion of said container portion.

4,174,041

RECLOSABLE DISPENSING CARTON

Gerald W. Turner, Norristown, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,323
Int. Cl.[2] B65D *5/54, 17/20*
U.S. Cl. 206—611 **2 Claims**



1. An end-opening, reclosable, tubular dispensing container formed of a unitary blank of foldable sheet material, for holding and shipping packaged articles such as sheets of paper or the like, comprising:

(a) a bottom wall, a top wall formed from a pair of panels, and a pair of side walls foldably joined to form a tubular body open at the ends;

(b) an integral, reclosable, dispensing end closure structure at one end of said body including:

(i) an at least partially separable hinge panel cut from material of said bottom wall and detachably joined to a forward edge thereof along a fold line and a pair of diagonally disposed weakened lines of tear diverging from the ends of said fold line toward said end closure structure;

(ii) an end panel foldably joined to said hinge panel;

(iii) a reclosure panel foldably joined at its outer side edge to said end panel and having a locking tab projecting from its inner side edge;

(iv) a securing panel attached to the outer surface of the top wall of said body for retaining said walls together and thereby forming said tubular body;

(v) a removable strip interposed between said reclosure and securing panels and detachably secured to each by parallel tear lines and defining said locking tab;

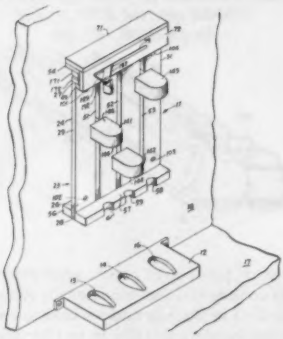
(vi) said top wall presenting an opening adjacent said one end of the body for receiving said locking tab after initial opening and reclosure of said container.

4,174,042

GUN LOCKING DEVICE

Rickey F. Fair, 3190 McMinn Rd., Sharpsville, Pa. 16150

Filed Jun. 19, 1978, Ser. No. 917,090
Int. Cl.[2] E05B *73/00;* **A47F** *7/00;* **A47B** *81/00*
U.S. Cl. 211—8 **7 Claims**



1. A locking mechanism for restraining an object having at least a first end and a second end in a rack having a fixed base of the type in which said first end of said object is seated in a depression in said base, said locking mechanism comprising:

(a) a shaft having a first end and a second end, and having a longitudinal axis extending from said first end to said second end of said shaft, said shaft further having a cross-section such that there exists a locus of points parallel to said longitudinal axis and located at a maximum radial distance from said longitudinal axis relative to all other points within said cross-section, said shaft further having a plurality of notches longitudinally disposed along said shaft, said notches being arranged in a substantially collinear manner along said locus of points and parallel to said longitudinal axis, said shaft further having an extension radially disposed to said first end of said shaft;

(b) containing means slidably mounted on said shaft, said containing means being receptive to said second end of said object, said containing means further being able to engage said notches of said shaft when said shaft is rotated to a given position;

(c) anti-rotation means, said shaft pivotally mounted to said anti-rotation means at said first end of said shaft and at said second end of said shaft about said longitudinal axis and in communication with said containing means for preventing pivoting of said containing means about said shaft thereby constraining said containing means to slide on said shaft without rotation; and

(d) locking means for restraining said extension of said shaft at said given position whereby rotation of said shaft is prevented and further preventing movement of said containing means.

4,174,043

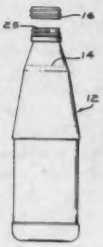
NITRILE PREFORMS AND CONTAINERS AND PROCESS IMPROVEMENTS FOR FORMING SAME

Morris Salame, Windsor, and Samuel Steingiser, Bloomfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1977, Ser. No. 850,364
Int. Cl.[2] B65D *23/00*
U.S. Cl. 215—1 C **48 Claims**

28. A container for environmentally sensitive materials formed of an irradiated thermoplastic material comprising at least 20 weight percent of a polymerized nitrile-group-contain-

ing monomer, said container having levels of unpolymerized nitrile monomer and extractable HCN of no greater than about



0.8 ppm based on the total weight of the polymer and about 50 ppb based on extracting liquid respectively.

4,174,044

ORIGINAL CLOSURE MEMBER

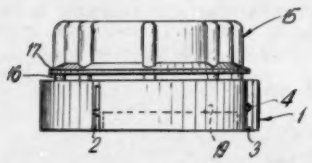
Otfried Kimm; Theo Hammes, and Peter Loebler, all of Cologne, Fed. Rep. of Germany, assignors to Mauser Kommandit-Gesellschaft, Brühl, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 946,969

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744787

Int. Cl.[2] B65D *41/34*

U.S. Cl. 215—252 **4 Claims**



1. An original closure member for a container comprising a screw cap having an axis about which it is screwed onto and unscrewed from the container and a safety ring which is destructible when said screw cap is unscrewed from the container, said safety ring including a break-off section having a predetermined point of separation, said safety ring including said break-off section having an inwardly facing surface, a stop cam formed on said extending inwardly from the inwardly facing surface of said break-off section, said stop cam being yieldable in the screwing-on direction of said cap and being unyieldable in the unscrewing direction of said cap, said cap having a plurality of lugs projecting downwardly from the lower end thereof in the axial direction of the cap, said safety ring being held rigidly in position on the container and one of said lugs being located adjacent to said stop cam for contact therewith when said screw cap is removed from the container, wherein said safety ring comprises a circumferentially extending section having a first end and a second end spaced angularly from said first end, said break-off section extending in the circumferential direction of said safety ring between the first and second ends of said circumferentially extending section thereof and having a first end and a second end spaced angularly apart, a break-off web interconnecting the first end of said circumferentially extending section and the first end of said break-off section, and a separation gap formed between the second end of said break-off section and the second end of said circumferentially extending section, a bridging strap located inwardly of said break-off section within said safety ring and connected at one end thereof to said circumferentially extending section adjacent the first end thereof and at the other end thereof to said circumferentially extending section adjacent the second end thereof so that said strap bridges the circumferentially extending portion of said safety ring formed by said break-off section, said bridging strap having an inwardly facing surface shaped to conform to the configuration of the container where the closure member is attached, said bridging strap having an upper edge spaced below the lower end of said cap when said cap is fully screwed onto the container so that said lugs on the lower end of said cap do not contact the upper edge of said bridging strap when said strap is screwed onto the container, a connecting web secured at one end to the inwardly facing surface of said break-off section intermediate the first and second ends thereof and at the other end to the outwardly facing surface of said bridging strap intermediate the ends thereof, and the inwardly facing surface of said circumferentially extending section of said safety ring located opposite said break-off section is shaped to conform to the configuration of the container where the closure member is attached.

4,174,045

LOADING PLATFORM

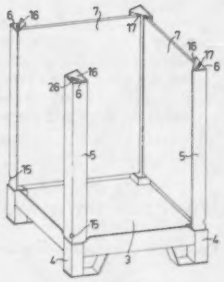
Karl H. Heller, Gehrden, and Dieter Schiron, Hanover, both of Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft Hanover, Fed. Rep. of Germany

Filed Nov. 29, 1977, Ser. No. 855,929

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 26543806

Int. Cl.[2] B65D *7/00, 87/00, 9/12*

U.S. Cl. 220—4 F **5 Claims**



1. A stackable loading platform, especially metallic platform, having a bottom with a plurality of corners, which includes in combination: a plurality of supports made of profiled rolled steel beams respectively located at said corners and detachably arranged therein, and a plurality of side walls arranged between and detachably engaging the respective adjacent supports, said side walls in the corner regions of their upper edges being positively connected to said supports upon insertion of said side walls from below, said supports being selectively movable in the longitudinal direction thereof away from said bottom for removing said supports from said platform, said side walls being releaseable from said supports which are shiftable at right angles thereto.

4,174,046

PALLET FRAMES

George T. N. Atkins, Macclesfield, England, assignor to Palletower Limited, Macclesfield, England

Filed Mar. 24, 1978, Ser. No. 889,698

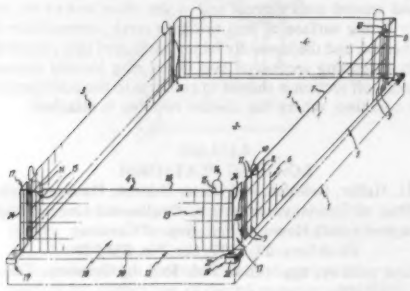
Claims priority, application United Kingdom, May 16, 1977, 20541/77

Int. Cl.[2] B65D *19/10, 7/20*

U.S. Cl. 220—6 **7 Claims**

1. A collar converter of the kind comprising a frame structure adapted to fit around the periphery of a load supporting surface and having interconnected side walls each adapted to extend upwardly at a respective side of said surface, each said side wall being of elongated form in that its height is a minor proportion of the transverse dimension thereof which extends

in use parallel to the respective side of said surface, and each said wall comprising an openwork structure formed from elongated metal members, said side walls all being interconnected by hinge joints such that the frame structure can be folded flat for storage when not in use, a lower part of the converter being arranged to seat in use on said load supporting surface and having downwardly projecting elements which



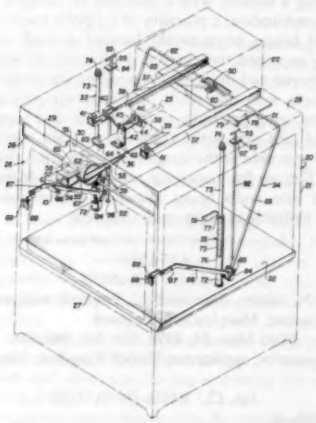
extend alongside the load supporting surface for locating the converter transversely relative to said surface and an upper part of the converter being adapted to define a seat for alternatively receiving another, upper pallet or another upper converter and having upwardly projecting elements arranged to fit alongside said upper converter or upper pallet for locating the converter transversely related to said upper pallet or upper converter.

4,174,047

VENDING MACHINE FOR NEWSPAPERS AND THE LIKE

Walter K. Owens, Crestview, Fla., assignor to 3-in-1, Inc., Crestview, Fla.

Filed Mar. 6, 1978, Ser. No. 883,820
Int. Cl.[2] G07F *11/16*
U.S. Cl. 221—154 **10 Claims**



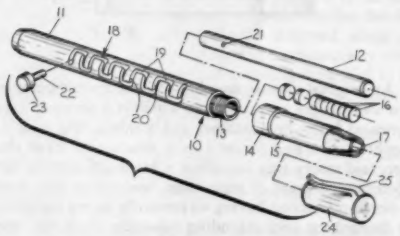
1. In a vending machine for newspapers and the like, a rectangular cabinet adapted to contain a plurality of newspapers in stacked relationship, said cabinet having a single newspaper dispensing slot formed in one wall thereof, a coin mechanism on said cabinet having a normally locked coin released control element spaced from said slot, and a reciprocatory single newspaper gripping, transporting and releasing device mounted on one wall of said cabinet and being connected to said control element of the coin mechanism and being manually movable within and through said slot when said control element is in a released state following the depositing of proper coins in the coin mechanism by a customer, said gripping, transporting and releasing device comprising a reciprocatory slide member, a coacting jaw member, a spring biasing the jaw member toward newspaper gripping relationship with the slide member, a manually operable camming means on said device to shift the jaw member away from the slide member to a newspaper releasing position, a spring-urged panel element in said cabinet engaging a stack of newspapers therein and biasing one endmost newspaper in the stack in one direction, and a coacting opposing newspaper stabilizing member in said cabinet in spaced relationship to said panel element and engaging said endmost newspaper to position and stabilize it for engagement by said device with said slide member and jaw member on opposite sides of said newspaper, whereby said endmost newspaper is gripped by said device, transported by said device through said slot and then delivered directly to the customer.

4,174,048

TABLET RETAINING AND DISPENSING DEVICE

John J. Volpe, Jr., 52 Taft St., Milford, Mass. 01757

Filed Oct. 4, 1977, Ser. No. 839,393
Int. Cl.[2] B65D *83/04*
U.S. Cl. 221—267 **2 Claims**



1. A tablet retaining and dispensing device comprising:

(a) a cylindrical member;

(b) a tablet containing cartridge removably attached to one end of said cylindrical member;

(c) an ejector rod assembled within said cylindrical member for engaging a tablet within said cartridge; and

(d) means operatively associated with said ejector rod which allows limited rotation of said ejector rod within said cylindrical member between positions which restrict longitudinal movement of said ejector rod within said cylindrical member and positions which allow limited longitudinal movement of said ejector rod within said cylindrical member a distance to cause the ejection of a single tablet from said cartridge, which includes:

(i) opposed side walls forming a channel communicating with the inner and outer surfaces of said cylindrical member having a configuration extending for a portion of the length of the latter defining a uniform square sine path; and

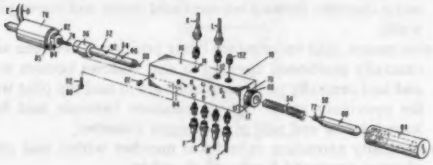
(ii) a selector pin fixedly attached to said ejector rod and extending in a direction normal to the axis of the latter outwardly through and beyond said channel.

4,174,049

DEVICE FOR PURGING PITOT AND STATIC LINE TUBES

Ralph A. Bolen, London, Ohio, assignor to John Sawyer, Cincinnati, Ohio

Filed Nov. 14, 1977, Ser. No. 851,167
Int. Cl.[2] B67B *7/24*
U.S. Cl. 222—5 **15 Claims**



12. A device for purging the pitot and/or pitot-static tubes of an aircraft with pressurized gaseous media which comprises:

a spool valve which includes an elongate valve body having an axial bore therethrough and having a forward and a rear end;

a valving spool reciprocably mounted within the axial bore of the valve body for movement between fully retracted and advanced positions, the forward end of said spool terminating in a hollow piercing-tip, said spool having an elongate hollow tubular forward portion and a cylindrical rearward portion;

a housing for the reception of a disposable gas cylinder removably secured to the forward end of the valve body and in open communication with the forward end of the axial bore thereof;

means secured to and carried by the rear end of the valve body for selectively advancing the valving spool from a fully retracted to a fully advanced position within the axial bore of said valve body;

said valving spool including at least one through-passageway for placing a pitot tube in open communication with a recording instrument when said valve spool is in a fully retracted position and for terminating the open communication between said pitot tube and recording instrument when the spool valve is in a fully advanced position;

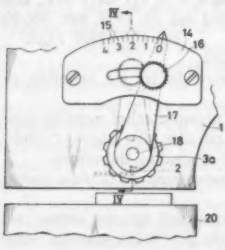
and means in said valve spool establishing communication between the interior of the hollow tubular portion of the valving spool and the pitot tube only when the valving spool has been moved to its fully advanced position.

4,174,050

DEVICE FOR SUPPLYING A REPLENISHING TONER TO A DEVELOPING UNIT

Tomio Saito, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,546
Claims priority, application Japan, Apr. 16, 1976, 51/43212
Int. Cl.[2] G01F *11/10*
U.S. Cl. 222—43 **6 Claims**



1. A device for supplying a replenishing toner to a developing unit provided in an electrophotographic copying machine, comprising:

a rotatable toner-supplying roller adapted to be rotated only in one direction and to provide a predetermined quantity of replenishing toner;

a one-way clutch connected to said toner-supplying roller and rotatable therewith;

a rockable member mounted on said one-way clutch and adapted to be engaged therewith only in the rotational direction of said toner-supplying roller;

means for rotating said rockable member alternatively clockwise and counterclockwise;

adjustable limiting means for limiting the angular displacement of said rockable member;

a selector associated with an indicator for determining the amount of toner to be supplied, said selector being operatively associated with said limiting means to position said limiting means; and

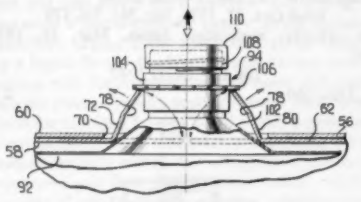
a shaft extending coaxially with said supplying roller, said selector and said limiting means being rigidly mounted on opposite ends of said shaft, respectively, so that said selector is operatively associated with said limiting means to position said limiting means.

4,174,051

PROTECTIVE LOCKING FLAPS FOR OPENING IN SEALED CORRUGATED CONTAINERS

Edgar B. Edwards, Warren, Pa., and Richard G. Wachter, Middletown, Conn., assignors to The Continental Group, Inc., New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,324
Int. Cl.[2] B65D *5/60, 5/46*
U.S. Cl. 222—105 **11 Claims**



9. In a carton for a container having a spout, a closure flap arrangement, said closure flap arrangement comprising first and second inner flaps and first and second outer flaps, said outer flaps being bonded to said inner flaps, said inner flaps having free edges positionable in opposed adjacent relation, opening defining means formed in said inner flaps and opening through said free edges for alignment with each other when said free edges are in said opposed relation to define a single opening, each of said opening defining means including a deflectable flap formed from the respective inner flap and permanently hingedly connected to said respective inner flap along a hinge line generally parallel to and remote from said respective inner flap free edge.

4,174,052

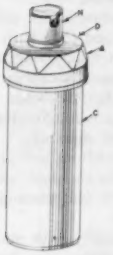
MECHANICALLY OPERATED DISPENSING DEVICE WITH EXPANSIBLE BULB

Nicholas G. Capra, East Hanover, N.J., and Roy Hammett, Miami, Fla., assignors to James D. Pauls, Ltd., Miami, Fla.

Filed Dec. 20, 1977, Ser. No. 862,551
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—207 **34 Claims**

1. A mechanically operated dispensing device, comprising: a manifold member having means thereon for attachment to a container; first expansible chamber means carried by the manifold member; manually operable actuating means carried by the manifold member and connected with the first expansible

chamber means to operate the first expansible chamber means; second expansible chamber means carried by the manifold member and comprising an elastomeric bulb having a closed end and an open end and adapted to receive and store a quantity of material under pressure, the pressure being provided by the elasticity of the bulb; and one way means associated with



the manifold member and with the first and second expansible chamber means to control flow from a container with which the dispensing device is associated into the first expansible chamber means, from the first expansible chamber means into the second expansible chamber means for accumulation of a quantity of material to be dispensed, and from the second expansible chamber means to a point of use.

4,174,053

VACUUM BOTTLE HAVING A TILT RESPONSIVE CLOSURE

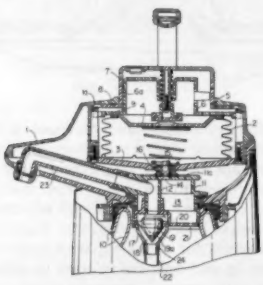
Masahiro Shimizu, Higashi-Osaka, Japan, assignor to Zojirushi Vacuume Bottle Co., Ltd., Osaka, Japan

Filed Oct. 27, 1976, Ser. No. 736,179

Claims priority, application Japan, Mar. 15, 1976, 51-31905[U]

Int. Cl.[2] B67D *5/42*

U.S. Cl. 222—209 **2 Claims**



1. A vacuum bottle manually operated safety pump comprising:

a cover portion, said cover portion including a top portion, said top portion including a centrally positioned horizontally extending aperture;

an outer push element, said outer push element including a radially outwardly extending flange, said radially outwardly extending flange being adapted to abut an inner face of said top portion adjacent the horizontally extending aperture;

an inner push element, said inner push element being positioned partially within said outer push element, said inner push element being operatively connected with said outer push element;

a pressure means, said pressure means comprising a bellows having a horizontal top wall, a horizontal bottom wall and a flexible side wall interconnecting said top and bottom walls, said top wall being operatively connected to said inner push element, said bottom wall including a centrally positioned opening communicating with the interior of said bellows:

a plug element, said plug element comprising a horizontally extending top plug wall having a centrally positioned aperture, a plug bottom wall spaced from said plug top wall, said plug bottom wall including a plurality of ports, said ports providing fluid communication between interior of said bellows and the interior of said vacuum bottle and a chamber formed between said upper and lower plug walls;

valve means, said valve means being positioned between said centrally positioned opening in said bellows bottom wall and said centrally positioned aperture in said top plug wall for providing an air-tight connection between said bellows interior and said plug element chamber;

a vertically extending cylindrical member within said plug element separated from said chamber;

a receiving portion formed in a lower portion of said cylindrical portion;

a liquid draw-up tube positioned within said vacuum bottle, said draw-up tube having an upper end in fluid-tight communication with said receiving portion of said cylindrical member;

a liquid discharge outlet, an interior end of said discharge outlet being in fluid-tight connection with an upper portion of said cylindrical member and an exterior end of said discharge outlet communicating to the exterior of said vacuum bottle;

closure means positioned between said cylindrical member lower portion and said draw-up tube upper end, said closure means comprising a vertically positioned inverted truncated cone element having a cylindrical neck portion formed as a continuous extension of the lower end thereof for mounting said draw-up tube upper end, and a radially inwardly extending horizontal upper wall having a central aperture formed therein, said cylindrical neck and said truncated cone upper wall aperture being axially aligned with said vertically extending cylindrical member, and a cooperating inverted cone-shaped closure element movable relative to said inverted truncated cone element, said closure element having a horizontally extending upper face, wherein when said vacuum bottle is in an upright position fluid is permitted to flow up said draw-up tube and through said closure means and vertically extending cylindrical member and out said liquid discharge outlet upon manual depression of said outer push element and when said vacuum bottle is in an inverted position said closure element horizontally extending upper face seats against said truncated cone upper face thereby fluidly sealing said truncated cone upper face aperture and preventing the flow of fluid to said vertically extending cylindrical member.

4,174,054

VOLUMETRIC FEEDER FOR METERING PARTICULATE MATERIAL

Elbert G. Hubbard, 6 N. 111 Gary Ave., Keeneyville, Ill. 60172

Filed Jul. 31, 1978, Ser. No. 929,220

Int. Cl.[2] G01F *11/20*

U.S. Cl. 222—241 **9 Claims**

1. A volumetric feeder for metering particulate material, comprising:

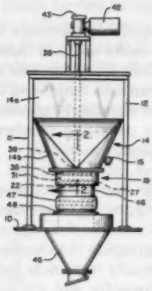
a stationary pressure relief member having a horizontally-disposed, circular, flat support plate and a cylindrical guide wall depending therefrom;

means for maintaining particulate material on said support plate;

a rotatably mounted agitator above said support plate for sweeping the particulate material radially outward so that it flows down said guide wall;

a horizontally-disposed stationary circular, flat metering plate, having a centrally located discharge orifice,

mounted below said pressure relief member for receiving and supporting the particulate material flowing down said guide wall;



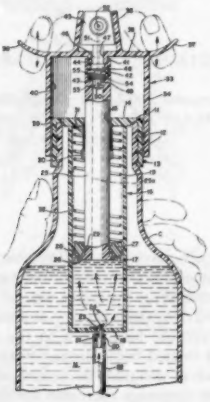
and a metering rotor, rotatably mounted between said pressure relief member and said metering plate, for sweeping the particulate material radially inward over said metering plate and through said discharge orifice.

4,174,055

NON-AEROSOL PRESSURE DISPENSER

Nicholas G. Capra, East Hanover, N.J., and Ronald L. Antenore, Coral Gables, Fla., assignors to James D. Pauls & J. Claybrook Lewis & Associates, Ltd., Miami, Fla.

Filed Apr. 20, 1977, Ser. No. 789,551
Int. Cl.[2] B67D *5/32*
U.S. Cl. 222—319 **20 Claims**



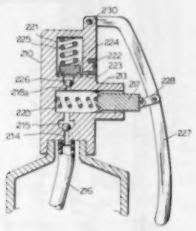
1. A dispensing device for dispensing material under pressure, comprises: a cap having fastening means thereon for attachment of the cap to an open end of a container of the material to be dispensed, said cap having an end wall for closing the open end of the container; an accumulating chamber carried by the cap in a position to extend through the container open end and into the container when the cap is fastened to the container; a piston reciprocable in the accumulating chamber for alternately drawing material into the accumulating chamber and then pressurizing the material to dispense it; a piston actuating rod connected with the piston and extending through the accumulating chamber; manually engageable piston actuating means outside the container and connected with the piston actuating rod to pull the rod and piston in a first direction outwardly relative to the container to enlarge the accumulating chamber volume and draw material from the container into the accumulating chamber; spring means engaged with the piston urging it in a second direction to pressurize material drawn into the accumulating chamber, said piston being movable in the second direction independently of the actuating rod; and discharge nozzle means connected with the accumulating chamber for selectively releasing the pressurized contents of the chamber.

4,174,056

PUMP TYPE DISPENSER WITH CONTINUOUS FLOW FEATURE

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1977, Ser. No. 795,553
Int. Cl.[2] B05B *11/02*
U.S. Cl. 222—321 **2 Claims**



2. A pump type dispenser for dispensing a spray of liquid, said dispenser being for mounting on a container for containing the liquid to be dispensed, said dispenser comprising a pump body member, a pump plunger member movable into and out of said pump body member, one end of said pump plunger member and said pump body member cooperating to define therebetween a piston-cylinder means, spring means between said members urging them apart, said pump body member having a liquid flow path therethrough having one end communicating with the container and the other end communicating with the piston-cylinder means, a check valve in said liquid flow path for blocking flow of liquid in said liquid flow path in the direction toward said container, a dispensing head integral with said pump body and having a free piston chamber therein, a pressurized liquid flow path from said piston-cylinder means into one end of said free piston chamber, a further check valve in said pressurized liquid flow path for blocking flow of liquid in the direction toward the piston-cylinder means, a free piston slidable in said free piston chamber, a free piston spring in said free piston chamber urging said free piston toward and into engagement with said one end of said free piston chamber, and nozzle means opening out of said free piston chamber through said dispensing head member from a position just above said one end of said free piston chamber, said free piston in the position in engagement with said one end of the free piston chamber obturating the fluid flow between said pressurized liquid flow path nozzle means.

4,174,057

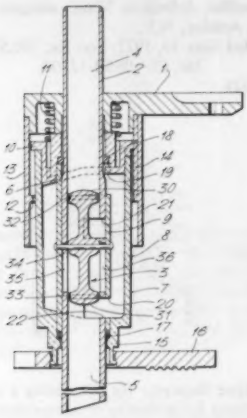
LIQUID MEASURING AND DISPENSING DEVICES

John A. Emery, Chicester, England, assignor to Sinclair International Bar Services Limited, Chichester, England

Filed Mar. 13, 1978, Ser. No. 885,946
Claims priority, application United Kingdom, Mar. 14, 1977, 10680/77
Int. Cl.[2] G01F *11/16*
U.S. Cl. 222—332 **6 Claims**

1. A liquid measuring and dispensing device comprising a central flow tube with means intermediate its ends to divdide the tube into inflow and outflow ducts, each duct having a respective inflow and outflow port in the tube side wall, a measuring chamber embracing the flow tube and having a cylindrical inside wall axially slidable along the outer surface of the flow tube and provide with liquid seals adjacent its ends

in contact with the said outer surface, and further ports in the chamber inside wall arranged so that at one end of the sliding movement of the chamber one of said further ports is in register with the inflow port and at the other end of the sliding movement of the chamber the other of said further ports is in register with the outflow port, and wherein the outside diameter of the flow tube is reduced over a portion of its length to cause one of the said seals to lose sealing contact with the tube as the outflow port comes into register with its respective port



in the chamber inner wall and thereby vent the chamber to atmosphere, and wherein the means to divide the flow tube comprises a shuttle within the flow tube fixed to the measuring chamber and having sealing means at each end for isolating a portion of the flow tube between the seals from the inflow and outflow ducts, the sealing means being located between the respective ends of that portion of the chamber inside wall extending between the further ports in the inside wall of the measuring chamber.

4,174,058

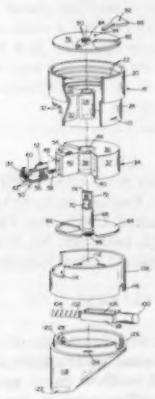
MATERIAL MEASURING AND DISPENSING DEVICE

Anthony L. Bassignani, 17 King St., Norfolk, Mass. 02056

Continuation-in-part of Ser. No. 761,894, Jan. 24, 1977, Pat. No. 4,071,171. This application Jan. 3, 1978, Ser. No. 866,219

Int. Cl.[2] G01F *11/40*

U.S. Cl. 222—438 **8 Claims**



1. A closure member for attachment to an outlet from a container of granulated material for providing dispensing of the contents thereof in successive increments of variable volume, said closure member comprising:

variable capacity dispensing means having an inlet end arranged for exposure to said container outlet and an outlet end;

barrier members oppositely pivotable about an axis to alternately close said outlet end and thereafter open said inlet end to said container for filling, and to close said inlet end and thereafter open said outlet end for dispensing;

operating means for oppositely pivoting said barrier members, including an operating member accessible from the exterior of said closure member,

said closure member, at least in the area containing said operating member, having a cross-section of a size and shape suitable for grasping in one hand, and said operating member being accessible for operation by a thumb or finger of a hand grasping the closure member in said area and having a generally rectilinear path of opposite operating movement inwardly and outwardly of said closure member; and

adjustment means accessible from the exterior of said closure member for adjustably varying the capacity of said dispensing means.

4,174,059

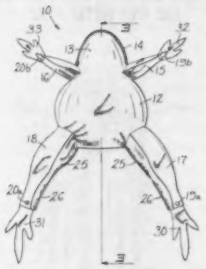
BACK PACK

Martha Maunder, 475 W. Woods Rd., Hamden, Conn. 06514

Filed Feb. 14, 1977, Ser. No. 768,048

Int. Cl.[2] A45F *3/04*

U.S. Cl. 224—209 **2 Claims**



1. A back pack having a hollow back storage portion adapted to reside on the back of a wearer and having a pair of flexible straps extending on either side of said back portion adapted to extend over the shoulders and under the arms of the wearer and secure the back pack to the wearer, a closable opening defined in said back storage portion, at least one of said straps of each of said pairs being hollow and having means defining closable openings thereinto for storage therein, and means for coupling together the straps to secure said back pack on a wearer, said back pack being in the form of a creature having a pair of anterior limbs and a pair of posterior limbs, said limbs forming said straps, said back portion defining the body of the creature.

4,174,060

DETACHABLE PAPER BAG CARRIER

David Porat, 17 Englewood Ave., Brookline, Mass. 02146

Filed Jun. 3, 1977, Ser. No. 803,242

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 H **4 Claims**

1. A detachable paper clamp comprising

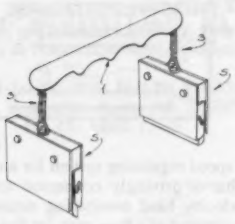
(a) a front plate having an inner face;

(b) a top member fixedly attached to a portion of the inner face of the front plate;

(c) two side plates fixedly attached to the top member whereby a volume of space is bounded on four sides by the

inner face of the front plate, the top member and the two side plates, said side plates leaving a channel between the inner face of the front plate and the edges of the side plate sufficiently wide to receive an upper end of a paper bag, each of said side plates further having a recess through its faces oriented on a diagonal upwards towards the top member and away from the inner face of the front plate;

(d) a travelling plate located within the volume of space, and having a protrusion on each of its two sides that slidably engages the recesses in the side plates, said travelling plate



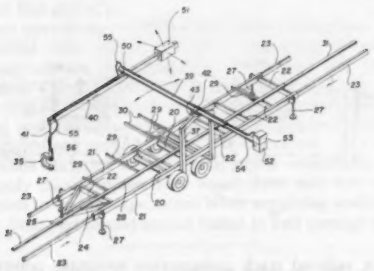
having a face substantially parallel to the inner face of the face plate, whereby the insertion of the upper end of a paper bag between the front plate and the travelling plate causes the travelling plate to move upwards and away from the inner face of the front plate until the upper end of the paper bag is substantially within the space between the inner face of the front plate and the face of the travelling plate and the paper bag will be so retained on the carrier when the travelling plate moves downwardly and towards the front plate to engage the paper bag.

4,174,061

PORTABLE APPARATUS FOR FABRICATING WOODEN TRUSSES

William D. McDonald, Rte. 1, Box 322C, Monroe, Oreg. 97456

Filed Jun. 6, 1978, Ser. No. 913,247
Int. Cl.² B25C *7/00*
U.S. Cl. 227—152 **13 Claims**



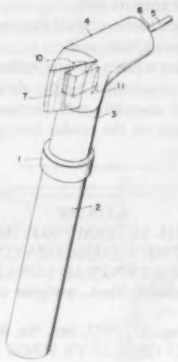
1. A portable apparatus for fabricating wooden trusses comprising a wheeled bed adapted to be towed and having a truss lumber supporting surface means, an upright support frame rising from one side of the bed near the longitudinal center of the bed, a main horizontally rotatable boom swiveled on the top of the upright supporting frame, a secondary boom carried by the main boom and being vertically swingable and horizontally rotatable relative to and independently of the main boom and being supported by the main boom at an elevation substantially above said bed, and a manually guided power clamping device suspended from the secondary boom and being operable to press nailing plates into opposite sides of lumber joints of a wooden truss being fabricated by the apparatus.

4,174,062

WELDING ROD HOLDER ACCESSORY

Lawrence E. Francis, R.R. #2, Spencerville, Ontario, Canada (K0E 1X0)

Filed Feb. 1, 1978, Ser. No. 874,050
Int. Cl.² B23K *37/00, 9/32*
U.S. Cl. 228—19 **1 Claim**



1. A combination welding rod holder and a chipper head, said welding rod holder having a handle with a free end and a holder head at the free end of the handle for supporting a welding rod at a predetermined point thereof, said combination welding rod holder and chipper head comprising

a chipper head removably affixed to the holder head in an area thereof spaced from and opposite the predetermined point thereof at which the welding rod is supported; and

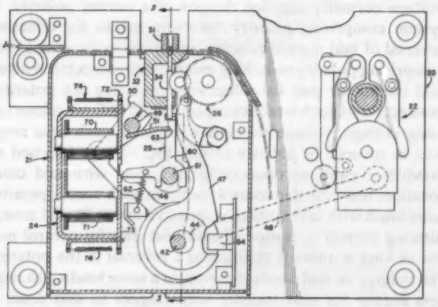
fastening means for removably affixing the chipper head to the holder head whereby said welding rod holder functions as a combination welding rod holder and chipper hammer, said fastening means comprising a pair of spaced slots formed in the holder head and a pair of spaced resilient clamp members affixed to and extending from the chipper head, said clamp members being removably clamped in said slots.

4,174,063

PAPER TAPE PUNCH AND READER

Jacob H. Drillick, Glen Rock, N.J., assignor to Drillick-LaManna Corporation, Hawthorne, N.J.

Division of Ser. No. 774,529, Mar. 4, 1977, Pat. No. 4,126,257.
This application Mar. 27, 1978, Ser. No. 890,536
Int. Cl.² G06K *1/05*
U.S. Cl. 234—130 **2 Claims**



1. A paper tape punch and reader having selectively operable bi-directional transports for the punch and for the reader comprising:

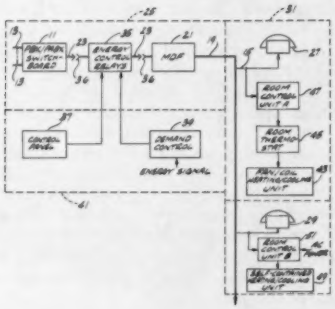
(a) a single continuously rotating drive shaft;
(b) said shaft driving a first reciprocating link for said punch transport;
(c) said shaft driving a second reciprocating link for said reader transport;
(d) a pair of angularly oscillating transport assemblies, one driven by said punch transport link and the other driven by said reader transport link;
(e) signal controlled bi-directional driving means on each of said transport assemblies; and
(f) a pair of sprocket wheels for controlling the movement of tapes, the first controlled by the driving means on the punch transport assembly and the second controlled by the driving means on the reader transport assembly.

4,174,064

ENERGY CONTROL SYSTEM PROVIDING SELECTIVE CONTROL OF REMOTE ZONE HEATING OR COOLING FROM A CENTRAL LOCATION

Fred Pratt, Jr., Humboldt, Tenn., assignor to Teleci, Inc., Jackson, Tenn.

Filed Dec. 27, 1977, Ser. No. 864,494
Int. Cl.[2] G05D *23/19*; H04M *11/00*
U.S. Cl. 236—1 B **23 Claims**



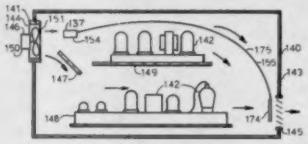
1. An energy control system for selectively controlling permissible temperatures in a plurality of remote zones from a control location, said zones each having heat transfer means normally operational for effecting heat transfer with respect to said zone to control temperature in said zone, said zones each being interconnected with said control location by respective telephone circuits each comprising ring and tip conductors constituting a conductor pair having a DC telephone operating voltage normally imposed thereon of a normal polarity, said system comprising polarity reversing means for effecting a reversal of said normal polarity, said polarity reversing means comprising polarity switching means interconnected with each said conductor pair for selectively reversing the polarity of connection of such conductor pair to said DC telephone operating voltage, voltage responsive means in each zone responsive to reversal of polarity of said DC voltage imposed on a conductor pair interconnecting said zone with said control location, heat transfer control means in each zone, operatively associated with said voltage responsive means in said zone, for altering normal operation of said heat transfer control means for as long as there is maintained a reversal in the polarity of the voltage on said conductor pair, in a sense tending to require less enerby for heat transfer with respect to said zone, said polarity reversing means and said voltage responsive means each operating independently of any telephone voice communication signals carried by said conductor pair without interruption by voice communication signals.

4,174,065

FLUID FLOW REGULATING SYSTEMS

Berthold A. Knauth, Daytona Beach, Fla., assignor to Knauth Design, Inc., Daytona Beach Shores, Fla.

Continuation-in-part of Ser. No. 838,676, Sep. 30, 1977, abandoned, which is a continuation of Ser. No. 692,845, Jun. 4, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,470
Int. Cl.[2] G01F *1/28*; F04B *49/00*
U.S. Cl. 236—49 **20 Claims**



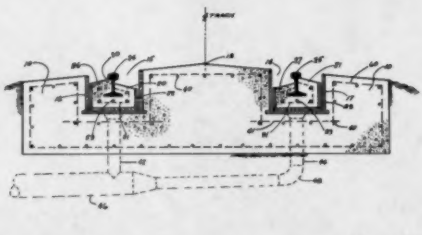
1. A motor speed regulating system for an electrically powered motor that is drivingly connected to a fluid impeller comprising velocity head monitoring means having a force sensor that is mounted in a flow path for fluid delivered by the impeller for sensing the velocity head of the fluid flowing along the path, temperature sensing means for sensing the temperature of fluid delivered by the impeller, and circuit means connected to a power source and to the motor, said monitoring means being responsive to velocity head changes sensed by the force sensor, said temperature sensing means being responsive to temperature changes sensed thereby, and said circuit means operating under the control of said monitoring means and said temperature sensing means to regulate the power delivered to the motor in accord with the sensed fluid velocity head changes and temperature changes.

4,174,066

CORROSION RESISTANT SELF-ALIGNING TRACK CONFIGURATIONS PARTICULARLY ADAPTED FOR RAILROAD CARS

William L. Dugasz, 396 Alpine St., Perth Amboy, N.J. 08861

Filed Jan. 10, 1978, Ser. No. 868,377
Int. Cl.[2] E01B *1/00*; E01F *5/00*
U.S. Cl. 238—7 **13 Claims**



1. A railroad track construction apparatus comprising a concrete bed of a predetermined length and having a top surface of a relatively triangular configuration forming a central apex relatively equidistant from a right and left side of said bed, said bed having first and second parallel "U" shaped channels located on said top surface, with said first channel nearer said right side and spaced a given distance from said apex, and said second channel nearer said left side and spaced relatively the same distance from said apex, a first and second channel vessel, each of a "U" cross-sectional configuration relatively congruent with said first and second channels for insertion of said first and second vessels in said first and second channels, said vessels including a first track positioned at a predetermined location in said first vessel, and a second track positioned at a predetermined location in said second vessel, each of said tracks extending from the open top of said "U" and positioned

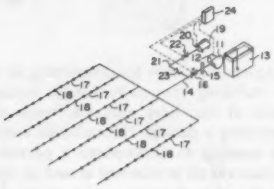
at said locations by means of a plurality of track supporting rods retained between said track and said vessels by means of a concrete binder located within the hollow of said "U" shaped vessel, wherein each of said supporting rods is of a relatively arcuate configuration having one end secured to a portion of said track at one side and a second end secured to a portion of said track at said opposite side with said rod disposed within said hollow of said "U" shaped vessel and having the major portion thereof facing the bottom surface of said vessel.

4,174,067

IRRIGATION SYSTEM

Sohsuke Watanabe, and Masahiro Metsugi, both of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,779
Claims priority, application Japan, Jul. 23, 1976, 51/88354
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—112 **1 Claim**



1. An irrigation system comprising:

a first source means for pressurized liquid, which comprises a pump and supplies irrigating liquid at a predetermined first pressure;

passage means for conducting said irrigating liquid from said source means to individual irrigation locations, comprising a plastic pipe having very small enlargeable slit openings on its outside surface extending through to its interior and lying transverse to its longitudinal direction, for continuously discharging liquid therefrom;

a second source means for compressed air, which comprises a compressor and supplies compressed air at a predetermined second pressure which is substantially higher than said first pressure;

and an operational control means, which comprises a first control valve which controls a connection of said first source means for pressurized liquid and said passage means, and a second control valve which controls a connection of said second source means for compressed air and said passage means; and which opposedly operates said first and second control valves, so that when one is opened the other is closed, and which temporarily stops supply of said pressurized liquid from said first source means to said passage means while supplying compressed air from said second source means to said passage means.

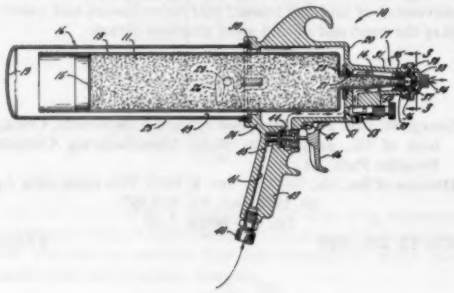
4,174,068

GUN HAVING DISPOSABLE CARTRIDGE

Robert L. Rudolph, c/o Cartri-Spray Corporation, 310 Peoples Ave., Rockford, Ill. 61101

Filed Nov. 7, 1978, Ser. No. 958,428
Int. Cl.[2] B05B *9/047*
U.S. Cl. 239—322 **5 Claims**

1. A gun for spraying flowable material, said gun comprising an elongated tubular barrel having a rear section with a closed rear end and having a separate forward section with an opening extending through its forward end, a forwardly opening tubular nozzle projecting forwardly from the forward end of said barrel and alined substantially with said opening, a disposable tubular cartridge containing said material and positioned removably in said barrel, means securing said rear and forward sections of said barrel together in end-to-end relation and being selectively releasable for the purpose of enabling said cartridge to be inserted into and removed from said barrel, said cartridge being spaced inwardly from said barrel to define a first passage between the cartridge and the barrel, a forwardly opening spout joined to and communicating with the forward end of said cartridge and telescoped through said opening and into said nozzle, said spout being spaced inwardly from said nozzle to define a second passage between the spout and the nozzle, a piston telescoped slidably into and closing the rear portion of said cartridge and being disposable as a unit with the cartridge, said piston being operable, when advanced forwardly, to force said material out of said spout, selectively operable means for admitting air into said first and second passages with the air



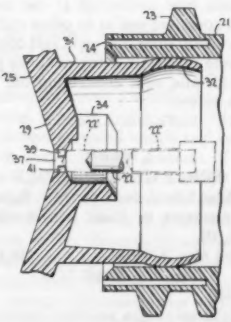
admitted into said first passage being effective to advance said piston, and means disposed adjacent the forward ends of said nozzle and said spout and coacting with the air admitted into said second passage to cause the material which is forced from said spout to spray out of said nozzle, said last-mentioned means comprising a head telescoped into said nozzle and over said spout and having a centrally located hole extending therethrough to allow material to pass out of said spout and through said head, and a series of holes extending through said head and spaced angularly around said centrally located hole, said series of holes communicating with said second passage to allow pressurized air in said second passage to flow through said head.

4,174,069

ADJUSTABLE SPRAY FLUID DISPENSER

Richard P. Grogan, Ontario, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,415
Int. Cl.[2] B05B *11/01*
U.S. Cl. 239—333 **8 Claims**



1. In a dispensing pump having a pump housing containing inlet and outlet passages defining a discharge path for fluid from a supply container to a circular discharge orifice, a needle

valve adjacent said outlet passage, a nipple surrounding said valve, a nozzle cap in engagement with said nipple for movement toward and away from said valve, said cap containing said orifice and having means defining an open ended swirl chamber thereon extending toward said valve and surrounding said orifice for effecting a discharge through said orifice of a fine fluid spray when movement of said cap toward said valve causes said valve to plug the open end of said swirl chamber means, the improvement comprising, said discharge orifice being defined by a circular wall opening and by a pair of opposed projections on said wall, said projections extending inwardly of said orifice toward one another and having free ends spaced a predetermined distance apart, whereby a fluid discharge of a substantially flat spray pattern is effected through said orifice between said spaced apart ends when the movement of said cap toward said valve causes said valve to plug the open end of said swirl chamber means.

4,174,070

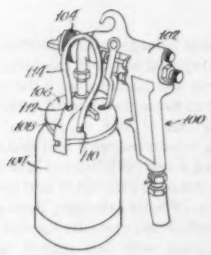
SPRAY GUN ASSEMBLY

George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Division of Ser. No. 740,121, Nov. 8, 1976. This application Apr. 10, 1978, Ser. No. 894,697

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—340 **6 Claims**



1. A syphon-type spray gun assembly, comprising a container for holding contents to be syphoned through a syphon tube into said gun for discharge therefrom, said container having a vent formed through a portion thereof not normally contacting the contents, and means connected with said vent exteriorly of said container for preventing passage of contents through said vent to exterior of said assembly upon manipulation of said assembly into any position wherein the contents contact the vent and would otherwise flow through the vent and drip from the assembly, said means for preventing passage including a flexible tube connected at one end to said vent exteriorly of said container and at its other end to a connector on the assembly remote from said vent, said tube enclosing said vent and containing therewithin any contents passing through said vent and with said vent connecting the interior of said container to atmosphere.

4,174,071

SPRAY GUN ASSEMBLY

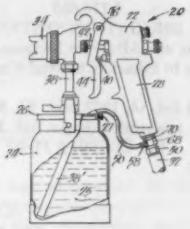
George W. Lau, Blue Island, and Edward J. Bujnowski, Chicago, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 8, 1976, Ser. No. 740,121

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—348 **4 Claims**

1. A syphon-type spray gun assembly including a spray gun and an associated container for holding contents to be syphoned therefrom, means for generating within said container a positive pressure with respect to ambient to urge the contents toward said gun, and means for limiting the pressure generated within said container to a predetermined value which is less than sufficient to move the contents into said gun, said container having a vent formed through a portion thereof not normally contacting the contents, said means for generating said pressure including means for connecting air under pressure with said vent, said means for limiting said pressure to said predetermined value including means for venting to atmosphere a portion of said connected air, said gun having an air inlet for receiving air under pressure to draw contents from said container by syphon and to be discharged from said gun



with the contents, said means for connecting air under pressure to said vent including conduit means for connecting said air under pressure at said inlet with said vent, said means for venting comprising a passage through said conduit means for continuously venting to atmosphere a portion of said connected air whenever air is received at said air inlet to maintain said pressure in said container at said predetermined value and less than the pressure of air at said air inlet both when contents are and are not being discharged from said gun.

4,174,072

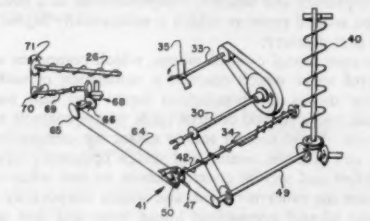
OVERLOAD PROTECTIVE DEVICE

Charles M. Kline, Reinholds, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 23, 1978, Ser. No. 889,310

Int. Cl.[2] B02C *25/00*

U.S. Cl. 241—35 **14 Claims**



1. In a crop feed grinding and mixing apparatus having a mixing means mounted to a mobile frame, a grinding means fixed to the frame, material transfer means extending at least between the grinding means and the mixing means, material infeed means in material flow communication with the grinding means and drive means including a first rotatable shaft and a second rotatable shaft, the first shaft being operably connected to the second shaft and the mixing, grinding, material infeed and material transfer means, the improvement in the drive means comprising:

a positively engaging, functionally nonfriction dependent speed responsive overload protective device mounted to the second rotatable shaft including a power transfer means with a block affixed thereto and a pivotable arm rotatably mounted adjacent the power transfer means having a first weighted end and a second driving end with a tab affixed thereto for mated driving engagement with the block to thereby drive the material infeed means so

that when the first rotatable shaft is slowed in operation below a predetermined speed by excessive crop feed accumulation in the grinding means the protective device automatically disengages the material infeed means from the drive means in order to permit the grinding means to continue to operate without any additional crop feed being delivered thereto until the first rotatable shaft returns to the predetermined speed, thereby automatically causing the tab to return to a condition of driving engagement with the block reengaging the material infeed means to permit the flow of crop feed material to recommence.

4,174,073

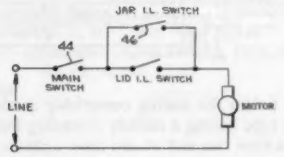
MULTI CONTAINER INTERLOCKED FOOD MACHINE WITH A SAFETY SWITCH FOR EACH CONTAINER

William M. Maher, Churchville, and Duane M. Seaburg, Oakfield, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 924,938

Int. Cl.[2] B02C *18/12*

U.S. Cl. 241—36 **8 Claims**



1. In a multi container interlocked food machine having a power base with a bowl-supporting portion and driven shaft extending vertically therefrom, and an upstanding motor-containing housing, a processor bowl having means locking it on said portion and containing a cutter on said shaft, a lid on said bowl operatively connected to an interlock of an internal lid switch-controlled motor energizing circuit to deenergize said circuit on lid removal, an improved cooperating second interlock comprising,

a separate smaller diameter blender jar and cutter disposable on said shaft,

base securing means on said jar locking it on said base portion concentric with said bowl means locking portion,

an internal jar switch connected to said switch,

said base securing means operatively connecting with said jar switch,

whereby on mounting said jar on the base, the jar switch is closed to "on" to by-pass the lid switch inactivating the processor bowl interlock for operation of the machine with said jar as a blender.

4,174,074

BALL MILL

Armin Geiger, Wattwil, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

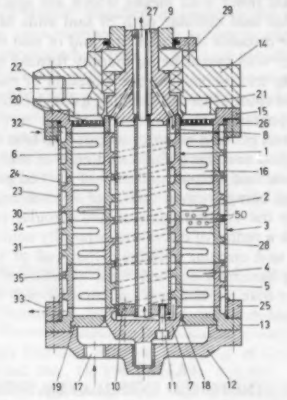
Filed Apr. 26, 1978, Ser. No. 900,192

Claims priority, application Switzerland, Apr. 29, 1977, 5273/77

Int. Cl.[2] B02C *17/16*

U.S. Cl. 241—46.11 **30 Claims**

1. Agitator mill for continuous grinding and dispersion of material suspended in a liquid, said mill comprising: a plurality of rotor ring elements, at least some of said rotor ring elements having rotor agitator members projecting outwardly therefrom, said rotor ring elements being aligned to constitute a rotor; a stator surrounding said rotor and having stator agitator members projecting inwardly therefrom; said rotor being mounted for rotation within said stator; said rotor and said stator forming a grinding chamber therebetween intended to hold a charge of grinding elements; stator cooling means for cooling said stator; rotor cooling means for cooling said rotor, said rotor cooling means comprising cooling ribs which at least in part form boundaries of rotor cooling channels and at least



in part are bounded by a surface of said rotor ring elements; and said rotor ring elements being replaceable and being highly wear resistant on surfaces that are intended to come into contact with said grinding elements.

4,174,075

APPARATUS FOR PROCESSING WASTE MATERIAL CHIEFLY COMPOSED OF PAPER AND PLASTIC FILM

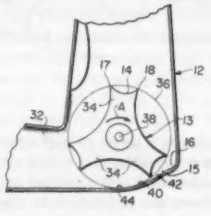
Manlio Cerroni, via Bruxelles 53, Rome, Italy

Continuation-in-part of Ser. No. 674,156, Apr. 6, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,807

Claims priority, application Italy, Apr. 16, 1975, 49142 A/75

Int. Cl.[2] B02C *13/06*

U.S. Cl. 241—189 R **2 Claims**



1. Apparatus for treating waste materials composed chiefly of paper and plastic film comprising: a casing including inner wall means defining a conduit through which said waste material is passed; conveyor means for delivering said waste material into said casing; reducer means essentially composed of a stellate rotor rotatably mounted within said casing and having rotary arms with ends engaging portions of said inner wall means of said casing to effect treatment of said waste materials; said rotor being mounted for rotation in a fixed direction about a fixed center of rotation with said arms being of a generally rigid configuration so that the ends thereof will be maintained generally equidistantly from said rotational center and will move through a generally circular path having a fixed radius while said rotor rotates; said casing inner wall means including a curved portion having a first and a second end, with said second end being located forwardly of said first end taken in the direction of rotor rotation, said first end being spaced radially outwardly from said circular path to form a gap between the ends of said rotor arms and said first end of said

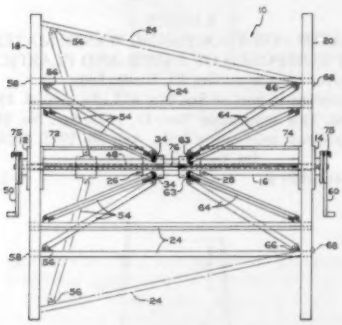
curved portion; and means defining an indented concave pocket located immediately upstream of said first end of said curved portion taken relative to the direction of waste material passage through said casing, said pocket being formed by portions of said inner wall means which are spaced radially outwardly from said circular path of said ends of said rotor arms a greater distance than said first end of said curved portion; said inner wall means being thereby formed to define an edge extending transversely of the direction of movement of the ends of said rotor arms and defining a demarcation between said concave pocket and said first end of said curved portion; with said curved portion being configured so that the spacing between said first end thereof and said ends of said rotor arms narrows toward said second end of said curved portion; said curved portion being formed with said second end generally conforming to the configuration of said circular path of said rotor and with a radius of curvature generally equivalent with the radius of said circular path; said first end of said curved portion being generally formed with a radius of curvature which is larger than the radius of said circular path of said ends of said rotor arms.

4,174,076

CUTTING STRETCHED INTERLAYER SHEETING

Richard J. Tolliver, Greensburg, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 8, 1977, Ser. No. 814,068
Int. Cl.[2] B29C *17/14;* B26D *3/28*
U.S. Cl. 242—56 B **6 Claims**



1. A method of cutting a series of individual sheets of thermoplastic interlayer material having a first side edge of a predetermined trapezoidal sheet and a second opposed side edge of said trapezoidal sheet, one of which side edges is longer than the other, from a continuous ribbon of said material having a dyed border portion along one of said side edges and that has been differentially stretched previously to approximately the differentially stretched condition desired, comprising:

(a) independently adjusting the circumferences at both ends of an adjustable mandrel to provide a conical shape approximately equal to an integral number of a given longitudinal length of said predetermined shape along one side portion of said mandrel and the same number of a different longitudinal length of said predetermined shape along the other side portion of said mandrel,

(b) winding a plurality of plies of said material onto said mandrel so adjusted in circumference at both ends to provide a conical shape having a circumference at one end that corresponds to an integral number of a given length along one side of said thermoplastic interlayer material and a circumference at its other end that corresponds to the same number of a different length along the other side of said thermoplastic interlayer material and rotatable about an axis of rotation,

(c) cutting said plies along an integral number of lines equal to said integral number at equi-angular relation therebetween, said lines extending in planes that intersect said axis, and

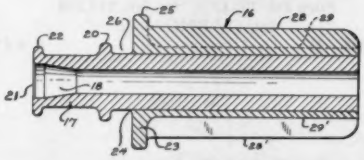
(d) removing the plies from said mandrel to provide a plurality of sheets of said predetermined trapezoidal shape having longitudinal side edges approximately equal to said predetermined different lengths, each of which has a dyed portion along said one side edge of said given length and said opposite side edge of said different length.

4,174,077

CORE HOLDER FOR REELING

Richard J. Charles, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 3, 1978, Ser. No. 921,579
Int. Cl.[2] B65H *75/02, 19/12, 19/30*
U.S. Cl. 242—68.6 **2 Claims**



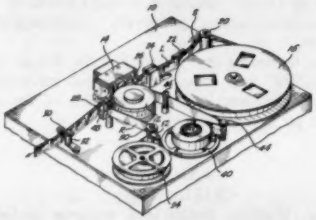
1. A core holder for reeling comprising a relatively elongated plastic tube having a radially extending flange adjacent to but spaced from one end of said tube, a plastic sleeve fixed on said tube adjacent the other end of said tube and terminating a spaced distance from said flange, said sleeve having radially outwardly projecting therefrom a plurality of longitudinally extending ribs.

4,174,078

TAPE TENSIONING APPARATUS PARTICULARLY USEFUL IN PRINTING APPARATUS

Robert J. Brooks, Woodinville, Wash., assignor to Interface Mechanisms, Inc., Lynnwood, Wash.

Filed Oct. 16, 1978, Ser. No. 951,624
Int. Cl.[2] B65H *25/22, 59/38*
U.S. Cl. 242—75.43 **16 Claims**



1. An apparatus for dispensing tape from a spool thereof and for regulating the tension in the tape so dispensed at a substantially constant value, said apparatus comprising:

first means adapted to receive said spool, said first means being supported for rotation about a first axis;

second means supported for rotation about a second axis which is proximate to and substantially parallel to said first axis, said second means including a tape guide which is adapted to engage a portion of the tape exiting from said spool, whereby said second means may be caused to rotate in a predetermined direction about said second axis by forces exerted on the tape which tend to draw the tape from said first means;

third means exerting a rotational force on said second means

so as to yieldably bias said second means to a predetermined angular position thereof;

a compressible, resilient member located between said first means and said second means so as to be capable of being compressed therebetween;

fourth means for varying the displacement between said first means and said second means, in an axial direction substantially parallel to said first and second axes, as the angular position of said second means is varied, said displacement being at a minimum when said second means is at said predetermined angular position so that said compressible, resilient member is fully compressed to substantially inhibit rotation of said first means relative to said second means, said displacement progressively increasing as said second means is caused to rotate away from said predetermined angular position as that said compressible, resilient member is progressively decompressed to permit rotation of said first means relative to said second means.

4,174,079

METHOD OF DETECTING TAPE TRANSPORT CONDITION

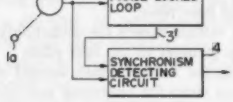
Kiyoshi Hayashi, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Aichi, Japan

Filed Feb. 22, 1977, Ser. No. 770,414

Claims priority, application Japan, Feb. 24, 1976, 51/19143

Int. Cl.² G11B *15/32*

U.S. Cl. 242—186 **4 Claims**



1. A method of detecting tape transport condition, which comprises deriving a signal from detector means provided in association with at least one of a pair of reel spindles to detect the rate of revolution of said reel spindle, said signal having a frequency proportional to said rate of revolution, applying said signal to a phase-locked loop having a lock range which is previously set so as to cover the rotational speed range of said reel spindle as the tape is being transported at a predetermined steady speed, applying to a synchronism detecting circuit said signal derived from said detector means and a signal derived from a voltage-controlled oscillator contained in said phase-locked loop, and detecting whether or not said two signals agree in frequency with each other.

4,174,080

TAPE CASSETTE

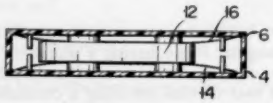
Hiroyuki Yamada, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,529

Claims priority, application Japan, Nov. 25, 1977, 52-158099[U]

Int. Cl.² G03B *1/04*

U.S. Cl. 242—199 **5 Claims**



1. A tape cassette having a pair of case members which are oppositely arranged to form a case body and are each provided with pins at the four corners on the major inner surface, a pair of reel hubs rotatably provided within the case body, and sheet members which are each provided at the four corners with holes and each fixedly attached in place to the major inner surface of the case member in such a manner that the holes receive the corresponding pins on the case member, wherein the distance between each pair of adjacent holes arranged on the sheet member along one of the sides of the sheet member is longer than the corresponding distance between each pair of adjacent pins arranged on the case member in order that the sheet member bends inwardly within the case body, with the maximally bent center part thereof resiliently contacting the corresponding sides of a tape loaded on the reel hubs.

4,174,081

APPARATUS FOR SECURING A FLYING CRAFT TO A STARTING AND LANDING AREA

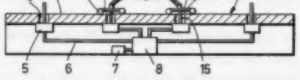
Wladimir Sardanowsky, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 16, 1977, Ser. No. 861,561

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658483

Int. Cl.² B64F *1/12*

U.S. Cl. 244—17.17 **24 Claims**



1. An apparatus for securing a flying craft to a starting and landing area, comprising landing platform means, at least one aperture in said landing platform means, suction means located for cooperation with said aperture, connection means including valve means operatively connecting said aperture in said landing platform means to said suction means, suction cup holding means secured to said flying craft, said suction cup holding means sealing said aperture against the atmosphere, said valve means being operatively arranged relative to said aperture, said valve means comprising actuator means for establishing a vacuum under said suction cup holding means when the latter covers said aperture when said flying craft is landing on said landing platform whereby the suction cup holding means are secured to said landing platform.

4,174,082

SOLAR POWERED HOT AIR BALLOON

Frederick Eshoo, 151 Kakh Ave., Tehran, Iran

Filed Dec. 15, 1977, Ser. No. 860,711

Int. Cl.² B64B *1/58*

U.S. Cl. 244—31 **19 Claims**

1. A solar powered hot air balloon, comprising:

an envelope;

a gondola suspended from the envelope;

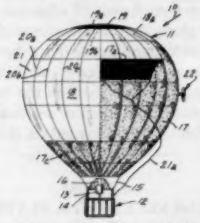
a highly translucent portion of the envelope;

an opaque portion of the envelope, said opaque portion having a substantially black light absorbing inner surface over substantially the entire opaque portion within the envelope positioned so as to receive a substantial portion of sunlight passing through the translucent portion;

substantially an entire outer surface of the opaque portion having a substantially total light reflecting outer surface means opposite the black inner surface for minimizing

radiation of heat from within the balloon through the opaque portion;

a horizontal plane relative to level flight passing through a central portion of the balloon at its largest periphery intersecting the opaque portion at one side of the balloon



and the translucent portion at an opposite side of the balloon; and

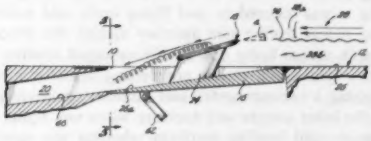
means for rotating the balloon about its vertical axis relative to level flight so as to position the translucent portion towards the sun.

4,174,083

FLOW DEFLECTOR FOR FLUID INLET

Larry W. Mohn, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 29, 1977, Ser. No. 792,332
Int. Cl.[2] B64D *33/02*
U.S. Cl. 244—53 B **9 Claims**



1. In an air or water craft in which the body of the craft has a fluid inlet for ingesting some of the fluid through which the craft passes, said inlet being flush with respect to an exterior surface of the body of the craft, said craft being equipped with a door mounted for movement between a closed position flush and the exterior surface of said body and an open position recessed inwardly from the exterior surface of said body to place said inlet in fluid communication with an inlet duct located interiorly of the craft body and associated with said inlet, the improvement in combination therewith comprising:

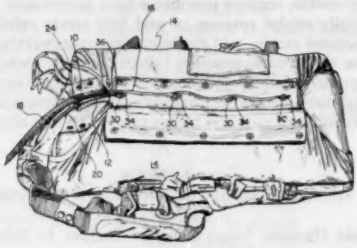
a wing-airfoil deflector supportively mounted on said door and oriented such that when said door is in its open position said deflector is spaced outwardly from said body so as to be positioned at a predetermined angle of attack to a stream of fluid flowing relative to said body along said exterior surface so as to interact with said stream to produce counterrotating flow vortices trailing said deflector which coact to cause a downwash of the fluid from said stream into said inlet.

4,174,084

DUAL PARACHUTE RIPCORD CABLE RELEASABLE CLAMP

Jon T. Matsuo, El Centro, Calif., and Ronald S. Boyum, Minneapolis, Minn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 784,107, Apr. 4, 1977, abandoned. This application Jun. 14, 1978, Ser. No. 915,499
Int. Cl.[2] B64D *17/52*
U.S. Cl. 244—149 **7 Claims**



1. A clamping device for securing adjacent manual ripcord and automatic power cable housings to a base plate on a parachute container comprising:

one clamp member for supporting the automatic power cable housing;

a first means for securing said one clamp member to spaced positions on the base plate;

a second clamp member for supporting the manual ripcord housing to the base plate;

a second quick release means for detachably securing said second clamp member to the base plate;

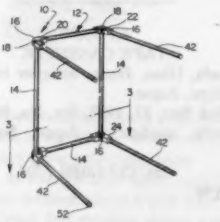
a lanyard connected between said second means and the parachute riser strap for operating said second means to detach said second clamp when a tension is applied to the strap for freeing the manual ripcord housing from the base plate whereby said automatic power cable remains clamped to the base plate when the manual ripcord housing is detached from the base plate.

4,174,085

COLLAPSIBLE TRASH BAG HOLDER

Richard A. Ferreira, and Albert Vincent, both of 82 Taunton Ave., East Providence, R.I. 02914

Filed Dec. 26, 1978, Ser. No. 973,881
Int. Cl.[2] A63B *55/04*
U.S. Cl. 248—97 **12 Claims**



1. A trash bag holder device comprising a substantially rigid generally rectangular frame having a plurality of elongated perimetal frame elements interconnected at the corners of said frame, each of said corners including a connecting member having a body, upper and lower pairs of spaced elongated support elements connected to said connecting members and outwardly projecting in a generally normal attitude from the

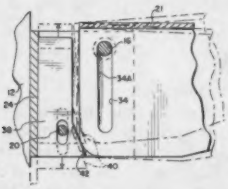
plane of said frame and each of said support elements terminating in a free end, the lower pair of said support elements and that frame element disposed therebetween adapted to contact a supporting surface so as to support said device in a use position with said frame disposed upright, the upper pair of said support elements and that frame element disposed therebetween adapted to support the folded upper peripheral edge of a flexible wall container such as a plastic trash bag so as to hold such bag in an open receiving position, said body including means for permitting said support elements to be moved to a storage position substantially coplanar with an adjacent frame element.

4,174,086

FOLDING TRAY RAIL BRACKET

John A. Verberkmoes, Grand Haven, Mich., assignor to Bastian Blessing Company, Inc., Phoenix, Ariz.

Filed Feb. 10, 1978, Ser. No. 876,648
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—242 **3 Claims**



1. A fold down tray rail comprising a tray supporting slide member, and a plurality of spaced brackets secured to the underside of the tray slide member, each bracket having a vertical flange defining a vertical track adjacent its inner end and facing its outer end,

bracket support means mountable on a wall for each bracket and having a horizontally disposed pivot pin engaging said track for relative vertical movement,

adjustable cam means carried by said bracket support means spaced from said pivot pin for engaging said bracket in cooperation with said pivot pin to adjust and determine in supporting relation the angle between the bracket and tray rail with respect to a weightbearing working position,

cam means defining a vertically adjustable cam member to vary the relative horizontal orientation of said relieved lower end of said bracket with respect to said pin, and

said bracket at its lower end engaging said cam means in its working position, and at its lower end being relieved to clear said cam means at the upper limit of bracket movement to free said bracket for downward hinging movement to a vertical depending position supported by said pin engaging said track.

4,174,087

SWIVEL SUSPENSION SET

Stanley Gaines, Roslyn Heights, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,198
Int. Cl.[2] F16B *45/00*
U.S. Cl. 248—339 **7 Claims**

1. An overhead swivel suspension set consisting of:

(A) a mount and

(B) a support,

(C) said mount including

(i) a base,

(ii) a ring below the base, the top surface of the ring constituting a step bearing,

(iii) legs connecting the ring to the base,

(iv) the base being securable to an overhead horizontal surface so as to hold the ring in horizontal position,

(v) the base, the legs and the ring being molded as a single piece,

(vi) the ring having a radial gap the width of which is less than the diameter of the opening through the ring,

(D) said support including

(i) a journal,

(ii) a head at the upper end of the journal, the head projecting laterally beyond the journal to provide a circular flange,

(iii) a grab at the lower end of the journal,

(iv) the diameter of the journal being greater than the width of the gap,

(v) the upper end of the grab below the journal having at least one lateral dimension which is smaller than the width of the gap over a vertical distance at least equal to the height of the ring,

(vi) the journal, the head and the grab being molded as a single piece,

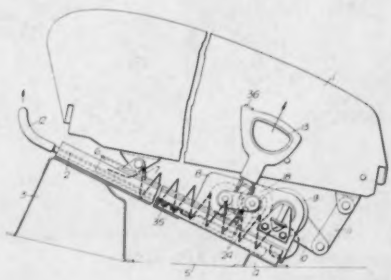
(E) whereby in order to assemble the support to a mount secured to an overhead horizontal surface, the support is held alongside the gap with the journal vertical and at a level higher than the ring and with the said lateral dimension of the upper end of the grab registering with said gap and perpendicular to the sides thereof, after which the support is moved with respect to the mount with said lateral dimension of the grab passing through the gap until the journal is located above the ring, and the support then is lowered until the journal is received within the opening in the ring and the head at the upper end of the journal rests against the top surface of the ring.

4,174,088

VEHICLE SEAT

Peter Schaefer, and Wolfgang Doerre, both of Gummersbach, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 18, 1977, Ser. No. 843,191
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647288
Int. Cl.[2] F16M *13/00*; B60N *1/02*
U.S. Cl. 248—395 **3 Claims**



1. A vehicle seat which is adjustable in the longitudinal direction by a first adjustment device including two spaced

guideways and the inclination of which is adjustable by a second adjustment device comprising:

a train of toothed gears for automatically coupling together said first and second adjustment devices; and

an adjusting lug associated with one of said two spaced guideways supporting two shafts **16** and **19** and an adjusting shaft **9** which effects the inclination adjustment, said two shafts **16** and **19** and said adjusting shaft **9** cooperate with each other by means of a plurality of gears, one of said plurality of gears being in mesh with a rack **14** of said one of said two spaced guideways;

said two shafts including a first shaft **16** having a first gear **15** and a second gear **17** and a second shaft **19** having a third gear **18** and a fourth gear **20**, said second shaft **19** being axially displaceable with respect to said third gear **18** and said fourth gear **20** and said first shaft **16** being displaceable with respect to said first gear **15** which is in mesh with said rack **14**, said second gear **17** being carried along;

said fourth gear **20** being in mesh with a gear **21** of said adjusting shaft **9**, while said third gear **18** in the initial position is in mesh with said second gear **17** which is axially fixed to said first shaft **16**;

a disk carried by said second shaft **19** having a projection thereon to engage on elongated hole is said third gear **18**; and

a locking device to secure said disk from twisting upon axial displacement of said first shaft **16** and said second shaft **19**.

4,174,089

MOLD FOR FIRING BODIES OF SILICA- OR ALUMINA-CONTAINING GRANULES

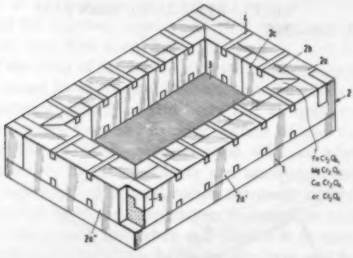
Sigismund Kienow, Wiesbaden, and Karl Briem, Braunschweig, both of Fed. Rep. of Germany, assignors to Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft, Braunschweig, Fed. Rep. of Germany

Filed Feb. 7, 1978, Ser. No. 875,863

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705121

Int. Cl.[2] **B28B** *7/34, 7/36*

U.S. Cl. 249—80 **8 Claims**



1. A mold for firing bodies of particles of silica- or alumina-containing material, said mold comprising:

a side wall; and

a floor having an upper surface consisting of ferrochromite, magnesiochromite, calciochromite, or trivalent-chromium oxide.

4,174,090

BALL VALVE WITH SPINDLE, HAVING PARALLELEPIPED-BEARING BLOCK JOINT PORTIONS

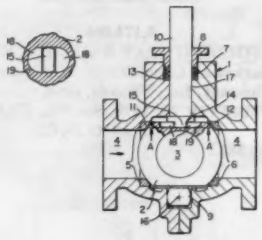
Juha A. E. Nelimarkka, Marjalahdentie 8, 00930 Helsinki 93, Finland

Filed Nov. 28, 1977, Ser. No. 855,333

Claims priority, application Finland, Dec. 28, 1976, 763719

Int. Cl.[2] **F16K** *25/00, 5/06*

U.S. Cl. 251—86 **5 Claims**



1. A ball valve comprising

a body provided with a flow channel;

a generally ball-shaped rigid closing organ;

sealing rings fitted into ring-shaped and transverse grooves in the valve body on both sides of said closing organ;

a pair of spindles associated with said closing organ and provided extending from opposite sides thereof for receipt by said body, and mounting said organ so that the pressure of fluid on said organ tips said organ into sealing engagement against a said sealing ring; and

means for actuating said organ to rotate it with respect to said body to effect opening and closing of said flow channel, said means including one of said spindles extending through said body to the exterior thereof through a sealing mechanism, said one spindle having a joint portion at a first end thereof; a pair of bearing blocks provided on a side of said organ adjacent to said one spindle, said bearing blocks straddling said one spindle joint portion and being spaced from each other and with respect to the dimensions of said joint portion so that a clearance is provided between said joint portion and said bearing blocks sufficient to allow tipping of said organ into sealing engagement with a said sealing ring under the influence of fluid pressure; and means for mounting said one spindle with respect to said bearing blocks so that low-torque turning of said organ is effected by initial rotation of said one spindle so that said joint portion engages said bearing blocks and moves said organ out of tipping engagement with a said sealing ring, and so that continued rotation of said one spindle effects rotation of said organ to a desired position.

4,174,091

DRAIN VALVE

William R. Donahue, Jr., Batavia, and Wesley S. Swanson, Elk Grove Village, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 737,111, Oct. 29, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,356

Int. Cl.[2] **F16K** *31/02*

U.S. Cl. 251—138 **4 Claims**

1. A drain valve for use in dishwashing machines, comprising:

(a) a housing defining a substantially continuously extending flow chamber having an inlet passage and an outlet passage and a valve seat disposed in said flow chamber intermediate said inlet and outlet in the flow stream therebetween;

(b) means defining a valve chamber communicating with

said flow chamber in a direction transverse with respect to flow therethrough;

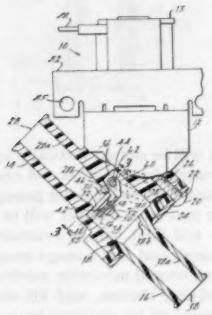
(c) valve means including a pivot member disposed within said valve chamber and having portions thereof pivotally mounted therein, said valve means including a poppet mounted on said pivot member, said member being movable between a closed position in which said pivot member extends into said flow chamber and said poppet sealingly engages said valve seat to prevent the flow of fluid therethrough and an open position in which said pivot member and said poppet are substantially within said valve chamber whereby said flow chamber is substantially unrestricted;

(d) means for biasing said pivot member and said poppet to said closed position;

(e) solenoid means mounted on said housing and including a movable armature;

(f) an actuator member having portions thereof connected to said armature;

(g) said pivot member including a crank section extending exteriorly of said flow chamber, said actuator member



having other portions thereof rotatably connected to said crank section near the free end thereof for translating movement of said actuator member to rotational movement of said pivot member; and

(h) spacer means received on said crank section near the free end thereof, said spacer means being an annular member defining a transversely extending abutment surface which registers against portions of said crank section thereby limiting movement of said annular member on said crank section, said spacer means being effective for positioning said actuator member on said crank section such that a predetermined amount of lateral movement of said actuator member is permitted toward and away from said spacer means at said point of connection to said crank portion, said lateral movement of said actuator member being effective for permitting alignment of said armature within said solenoid for minimizing chatter and vibration therein, wherein said solenoid is operable upon activation to overcome the force of said biasing means to move said actuator member and said crank member thereby moving said poppet member to said open position.

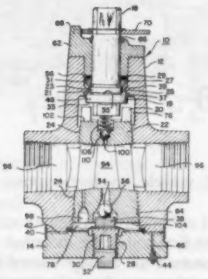
4,174,092

ROTARY VALVE WITH STEM SEAL MEANS

John G. Macleod, Butler, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,509
Int. Cl. F16k *31/44*
U.S. Cl. 251—214 **10 Claims**

1. A valve comprising: a casing having a passageway therethrough for the flow of fluid, said casing having a bore intersecting the passageway; a flow regulating member rotatably mounted in the bore for blocking said passageway in a valve closed position of said flow regulating member, said flow regulating member having a port therethrough for connecting and being in communication with said passageway in a valve open position, said flow regulating member and said casing defining a first chamber at one end of said flow regulating member; a stem rotatably mounted within said casing and mechanically coupled to said flow regulating member within said casing, said stem having an annular rim formed toward and positioned within said first chamber; at least one annular seal surrounding said stem to effect the seal between said stem and said casing; means for introducing a pressure equal to or greater than the line pressure into said first chamber whereby said pressure acts on said annular rim to move said stem in an axial direction to compress said annular seals; said flow regu-



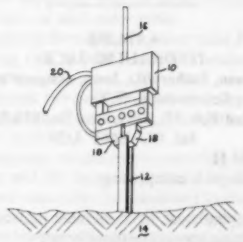
lating member is a tapered plug rotatably mounted in said bore which is tapered to conform to said tapered plug, said plug and said casing defining said first chamber at the smaller end of said plug; the outside diameter of said annular rim formed on said stem is less than the inside diameter of said first chamber; a ring surrounds said stem to rotate therewith, said ring having a radially extending face which sealingly contacts said annuar seal; a pressure tight seal is effected by said annular seal, there being moving contact between the outer surface of said stem and the inward facing surface of said annular seal and between said radially extending face of said ring and said radially extending surface of said annular seal in contact with said radially extending face.

4,174,093

GRIPPER JAW

Thomas R. Shearer, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 28, 1978, Ser. No. 901,247
Int. Cl.[2] E21B *19/00*
U.S. Cl. 254—29 R **6 Claims**



1. A gripping jaw for a driving/extracting head and comprising: a block-like body having a front face and a back face with said back face adapted for attachment to a powerdriven arm; said front face having holes formed therein and compacts of hard wear resistant material seated in said holes with an end of said compact protruding beyond said front face and bores

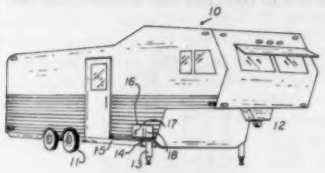
smaller than said hole extending from said hole through said back face of said block.

4,174,094

RECREATIONAL VEHICLE LEVELING AND SUPPORT SYSTEM

Joseph M. Valdespino, 5023 Golf Club Pkwy., and Ronald A. Brandl, 3040 N. Pine Hills Rd., both of Orlando, Fla. 32808

Filed Feb. 3, 1978, Ser. No. 874,852
Int. Cl.[2] B60S *9/02*
U.S. Cl. 254—86 H **5 Claims**



1. A recreational vehicle leveling system comprising in combination:

a plurality of fluid cylinders each having at least two telescoping rods, the first rod being mounted in the cylinder casing, and the second rod being mounted in the casing of the first rod to telescope the cylinders from the main casing;

an electrical power source;

electrical motor driven compressor connected to said electrical power source;

valve means operatively connected between said compressor and each said fluid cylinder, said valve means having a manifold connected to said compressor and having a plurality of air lines extending therefrom, each air line having an individual valve therein operated by a valve handle and each air line being connected to one of said plurality of fluid cylinders;

means to reverse the pressure applied to said valve means by said compressor from a positive to a negative pressure, whereby said slidable cylinders can be driven in two directions by the air pressure applied thereto and said means to reverse the pressure applied to said valve means, and said valve means operating handles being located in a panel adjacent each other, whereby each said cylinder can be operated in either direction from a central point; and

means for locking each said air cylinder in position following the leveling of said recreational vehicle said means for locking each said cylinder having a pair of locking clamps located on each cylinder.

4,174,095

HYDRAULIC JACK

Donald I. Chipman, Estherville, Iowa, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,729
Int. Cl.[2] B66F *3/24*
U.S. Cl. 254—93 H **5 Claims**

1. A hydraulic jack comprising:

a base,

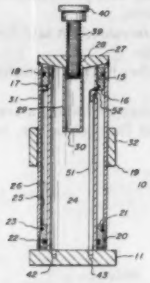
an elongate, cylindrical, fixed member mounted on said base and projecting upwardly therefrom

an elongate, cylindrical, moveable member positioned exteriorly around said fixed member and having its inner surface spaced from the exterior surface of said fixed member,

means closing the upper end of said moveable member,

the interior of said fixed and moveable members defining an expandable and contractable first chamber, the space defined between the exterior surface of said fixed member and the interior surface of said moveable member defining a second expandable and contractable chamber,

a pair of passage means in said base and being connected to a source of fluid under pressure, one of said passage means being connected in communicating relation to said first chamber and the other passage means being connected to a conduit projecting upwardly from the base through the interior of said fixed member and being connected to a part in the upper end portion of said fixed member, said part being connected in communicating relation to said second chamber whereby when fluid is directed through said one passage means into said first chamber, said moveable member will be shifted vertically upwardly and fluid will be evacuated from said second chamber, and when fluid is directed through the other passage means into said chamber, the moveable member will be shifted vertically downwardly and fluid will be evacuated from said first chamber through said first passage means,



and a lift element on said moveable member being vertically adjustable relative thereto, said lift element adapted to engage a device to be elevated by said jack, whereby when said moveable member is shifted vertically upwardly relative to said fixed member, the device engaged by the lift member will be elevated.

4,174,096

FENCE

David L. Campbell, Anchorage, Ak., assignor to Richard G. Miller; Clifton W. Little, both of Houston; Alex Yovan, Alta Loma, all of, Tex.; Charles M. Gause, Anchorage, Ak.; Don Harvey Campbell, Freeport, Tex.; Sam P. McManus, Houston, Tex.; David L. Weiler, Brookshire, Tex.; Clodis H. Cox, Katy, Tex.; Mable E. Weiler, Rapid City and Richard T. Weiler, Sterling Heights, both of, Mich.

Filed Jun. 6, 1977, Ser. No. 803,880
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **25 Claims**

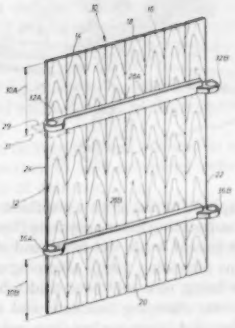
1. A rail fence section adapted for interchangeable mounting on an upstanding mast comprising:

a wall portion having a front and a rear surface, a first and a second horizontal edge, and a first and a second vertical edge;

a first and a second mounting member respectively disposed adjacent said first and second vertical edges of said wall portion, each mounting member having a mast-receiving opening extending therethrough, each mounting member having a mating surface thereon, said mating surfaces being disposed in a common plane, each mounting member being connected to said wall portion such that said first mast-receiving opening is disposed adjacent said front surface of said wall portion and said second mast-receiving opening is disposed adjacent said rear surface of said wall portion;

said mating surface on said first mounting member adapted to matingly engage against a mating surface on a second

mounting member of a next-adjacent fence section such that said opening in said first mounting member vertically registers with an opening extending through the second



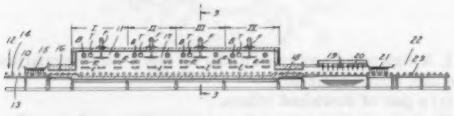
mounting member on the next-adjacent fence section and such that the mounting members on each adjacent fence section are obscured when viewed from both the front and rear.

4,174,097

FURNACE FOR BRIGHT ANNEALING OF COPPER

Donald J. Schwalm, Northville, Mich., assignor to Holcroft & Company, Livonia, Mich.

Filed Nov. 3, 1977, Ser. No. 848,155
Int. Cl.[2] F27B *9/04*
U.S. Cl. 266—87 **8 Claims**



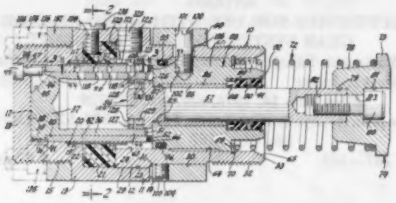
1. In a controlled atmosphere heat treating furnace having a tunnel, the combination of an atmosphere producing device pre-set to fire continuously into said tunnel at a constant rate and ratio independently of any thermostatic control to produce the desired atmospheric composition whereby the heat is constantly released directly within said tunnel independent of any thermostatic regulation, auxiliary means within said tunnel for adding or subtracting heat as required to maintain the desired heat treating temperature and thermostatic means responsive to the temperature within said tunnel for regulating the heat supplied by said auxiliary means independent of the heat constantly released by said atmosphere producing device.

4,174,098

SHOCK ABSORBER AND MOUNTING MEANS THEREFOR

Ralph C. Baker, Northville; Larry E. Ellis, Farmington, and Francis M. Simpson, Jr., Livonia, all of Mich., assignors to ACE Controls, Inc., Farmington, Mich.

Filed Jul. 3, 1978, Ser. No. 921,589
Int. Cl.[2] F16F *9/19, 9/34, 9/44*
U.S. Cl. 267—8 R **14 Claims**



1. A shock absorber comprising:

(a) an outer tube which is enclosed at one end and open at the other end;

(b) an inner tube mounted in the outer tube, through the open other end of the outer tube, and having an enclosed inner end disposed against the enclosed end of the outer tube and being open at its outer end;

(c) a piston assembly extended into the outer tube open end and being slidably mounted in the open outer end of the inner tube;

(d) said piston assembly including a piston rod having an impact receiving button on the outer end thereof for receiving loads to be decelerated;

(e) an accumulator chamber formed interior of said outer tube and between said inner tube and outer tube;

(f) a plurality of longitudinally spaced metering orifices forming through said inner tube and communicating said inner tube with said chamber;

(g) a meter tube rotatably mounted in said outer tube and about said inner tube engageable with the inner tube for retaining it against axial movement in the outer tube, and provided with a plurality of metering openings for regulating the flow of fluid through said metering orifices in the inner tube during a load deceleration operation;

(h) an inner tube lock member mounted in said enclosed end of the outer tube and engageable with the inner tube for retaining the inner tube against rotation in the outer tube;

(i) a rotatable retainer member detachably mounted in said open other end of the outer tube and having said piston rod slidably mounted therethrough;

(j) a meter tube adjusting ring rotatably mounted about the outer periphery of said outer tube;

(k) means extended through said outer tube for connecting said adjusting ring to said rotatable retainer member in said outer tube;

(l) means mounted between the rotatable retainer member and said meter tube for axially retaining the meter tube in its operative position;

(m) fluid passageway means interconnecting said accumulator chamber and the open end of said inner tube; and,

(n) means in said outer tube for admitting hydraulic fluid into said accumulator chamber, fluid passageway means and inner tube, whereby when the piston assembly is moved inwardly of said inner tube, when an impact load is received by said piston assembly, the fluid in the inner tube is forced through the metering orifices in the inner tube and through the metering holes in the meter tube and into said accumulator chamber and through said fluid passageway means and into the open end of the inner tube behind the piston assembly, and when the piston assembly is moved outwardly of said inner tube after said impact load is decelerated, the fluid in the open end of the inner tube

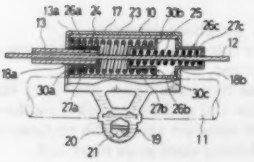
is forced from the open end of the inner tube and back through the fluid passageway means and through the accumulator chamber and through said metering holes and orifices and into the inner tube in front of the piston assembly.

4,174,099

SAFETY DEVICE FOR USE WITH SPEED CHANGE GEAR SYSTEM OF A BICYCLE

Kazuto Yamasaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1978, Ser. No. 877,739
Claims priority, application Japan, Feb. 14, 1977, 52-17130[U]
Int. Cl.[2] F16F *3/04*
U.S. Cl. 267—168 **9 Claims**



1. A safety device for use with a speed change gear system of a bicycle comprising:

a hollow cylindrical shell member having an opening at opposite ends thereof, respectively;

a first coil spring of larger diameter and a second coil spring of smaller diameter, both of which are disposed within said shell member in coaxial alignment and in partially overlapped relation with each other;

three axially spaced slide members, viz., a first slide member, a second slide member, and a third slide member, axially slidably disposed within said shell member, respectfully, so as to cooperate with said first and second coil springs;

each of said three slide members including a hollow cylindrical body which has an opening end at one side formed with an integral annular flange, and an end wall at the other side formed with a through hole for permitting a bicycle gearshift wire to pass therethrough;

said first slide member being disposed adjacent one end of said shell member and connected to one end of a tubular sheath which extends between said shell member and a rear derailleur for bicycle speed change;

said gearshift wire passing through said tubular sheath for operatively connecting said rear derailleur with a speed change lever of a bicycle;

said second slide member being disposed between said first slide member and said third slide member;

said third slide member being disposed adjacent the other end of said shell member;

said first slide member being disposed with its cylindrical body directed axially inward;

said second slide member being disposed with its cylindrical body axially directed toward said first slide member;

said third slide member being disposed in such a manner that its cylindrical body projects out of one end of said shell member;

said first coil spring being interposed in abutment between said annular flange of said first slide member and said annular flange of said second slide member, and

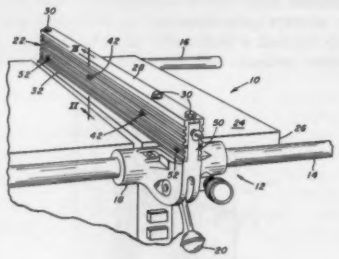
said second coil spring being interposed in abutment between said end wall of said second slide member and said end wall of said third slide member.

4,174,100

ADJUSTABLE FENCE

John H. Estess, Tupelo, Miss., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1978, Ser. No. 890,145
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—306 **4 Claims**



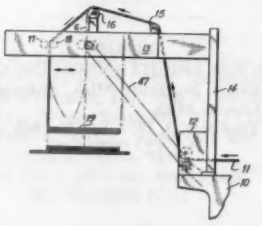
1. A guage adapted for use with a machine tool having a worktable, gauge supporting means separate from the table but secured thereto adjacent both the front and the rear edges thereof, said means providing gauge clamping surfaces therealong, said gauge being movable over said table, said gauge having front and rear clamping brackets, and a two-part rail member connecting said clamping brackets, said two-part rail member comprising, a downwardly open channel-shaped upper member fixed to said clamping brackets and a table-engaging lower member adjustably fixed to said upper member.

4,174,101

HIGH SPEED HORIZONTAL FOLDER

Robert Frezza, Carle Place, N.Y., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,487
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **13 Claims**



1. A high speed horizontal folder for fabric web material and the like, which comprises

(a) a pair of downfeed rollers,

(b) reciprocating means for reciprocating said downfeed rollers back and forth over a folding platform at a predetermined rate of reciprocation.

(c) means to deliver the web material in a generally downward direction to said downfeed rollers at a steady rate corresponding to said rate of reciprocation of said downfeed rollers,

(d) a drive means to rotatingly drive said downfeed rollers comprising an endless drive element mounted on said folder at a position remote from said reciprocating means and means for driving said element so that at least a portion thereof is advanced unidirectionally at a constant rate corresponding to the rate of delivery of the fabric web,

(e) means interconnecting the downfeed rollers to said unidi-

rectionally driven portion of the drive element in any position of the downfeed rollers, whereby said drive element tends to drive the rollers at a faster rotational speed when the rollers are moving in a first direction of a reciprocating stroke and at a slower rotational speed when the rollers are moving in the opposite direction of the reciprocating stroke, and

(f) compensating means associated with said interconnecting means and said downfeed rollers providing differential peripheral speeds for the respective downfeed rollers to compensate for the faster and slower rates of speed caused by the relative motion between said unidirectionally moving portion of the drive element and said reciprocating downfeed rollers, thereby providing a uniform rate of delivery of the fabric web by the downfeed rollers.

7. A high speed horizontal folder for fabric web material and the like, which comprises

(a) a pair of horizontally reciprocating downfeed rollers,

(b) downfeed roller carriage means supporting said rollers at each end,

(c) means to deliver the web material in a generally downward direction to said downfeed rollers at a predetermined rate of delivery,

(d) unidirectionally moving endless carriage drive means for effecting reciprocating movement of said downfeed rollers at a rate substantially equal to said rate of delivery of web material to the folder,

(e) a pair of counterweights, one opposite each end of the downfeed rollers, mounted for reciprocation substantially in the reciprocating plane of said downfeed rollers,

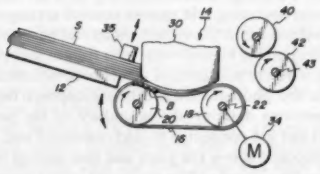
(f) said counterweights being connected to said unidirectionally moving endless carriage drive means for reciprocation approximately 180° out of phase with the reciprocating motion of said downfeed rollers, whereby the moving weight of said counterweight effectively balances out the inertia of said downfeed roller carriage means, and

(g) continuously driven downfeed roller drive means engaging said downfeed rollers in any position for effecting continuous, substantially constant speed rotation thereof during reciprocation thereof.

4,174,102
SHEET SEPARATING AND FEEDING APPARATUS

Don P. Clausing, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,217
Int. Cl.² B65H *3/04*
U.S. Cl. 271—35 **8 Claims**



1. An apparatus for feeding and separating individual sheets from a stack of sheets which comprises in combination:

a belt member mounted adjacent the forward edge of the stack of sheets for feeding from the bottom of the stack;

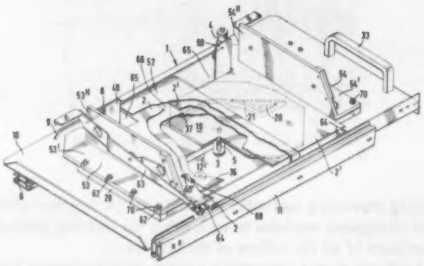
friction retard means positioned along said forward edge of the stack to allow feeding of only one sheet beneath said friction retard;

sheet transport means positioned in the path to advance the sheets as they are fed by said belt member, said belt member being pivotable on an axis to move from a first position in contact with the bottom of the stack to a second position in a direction away from said stack whereby the retard forces on the sheet being fed are greatly reduced, wherein said sheet transport means includes a plurality of rolls coaxial with said pivot axis.

4,174,103
MAGAZINE FOR HOLDING A STACK OF SHEET MATERIAL

Günter Back, Hofheim-Diedenbergen, and Reinhold Euler, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,326
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715948
Int. Cl.² B65H *1/04, 3/56*
U.S. Cl. 271—171 **25 Claims**



1. A magazine for holding a stack of sheet materials and being adjustable to accommodate stacks of different size sheet materials, comprising:

a. a base plate;

b. two sliding plates mounted on said base plate so as to be longitudinally slideably displaceable with respect to each other;

c. a bottom plate positioned in spaced relationship above said sliding plates and being mounted on said base plate so as to be laterally slideably displaceable;

d. a cam follower mounted on the side of said bottom plate facing said sliding plates;

e. means, mounted on one opposing axial end of each of said sliding plates, for longitudinally confining the stack of sheet materials;

f. means, mounted on at least one lateral side of said bottom plate, for laterally confining the stack of sheet materials; and

g. means, including a lever pivoted on said base plate and positioned in the space between said sliding plates and said bottom plate and a cam disk pivoted on said base for rotation with movement of said lever and positioned above said lever in said space so as to engage the camming surface of said cam disk with said cam follower, for longitudinally displacing said sliding plates and laterally displacing said bottom plate in response to movement of said lever.

4,174,104
CONVEYOR FOR CARDS AND SIMILAR ARTICLES

Mark C. Garvey, Antioch, Ill., assignor to Garvey Corporation, Blue Anchor, N.J.

Filed Jul. 27, 1977, Ser. No. 819,465
Int. Cl.² B65H *5/06*
U.S. Cl. 271—272 **8 Claims**

1. A conveyor for moving a plurality of articles including cards successively in flat horizontal position comprising

a plurality of supporting structures each comprising an inverted channel the web of which provides a longitudinally elongated bed,

a plurality of rollers mounted in each supporting structure

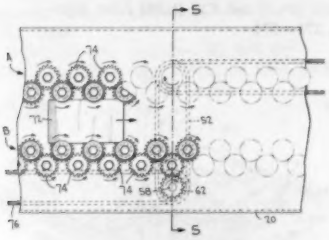
along said bed for rotation on vertical axes in two longitudinally extending lines laterally spaced apart,

each roller having a peripherally chamfered end portion and an axially spaced drive-receiving portion,

power means including an electric motor carried by each supporting structure connected to the drive-receiving portions of the rollers for rotating the rollers of the two lines in opposite directions,

whereby each supporting structure and its supported elements comprise a complete conveyor module,

means splicing the modules endwise to each other to form a continuous conveyor,



gearing traversing said splicing means connecting the rollers of contiguous modules to each other for insuring uniform rotation of all the rollers of the conveyor,

said splicing means comprising a short upright channel having its upturned flanges bolted to the downturned flanges of adjacent supporting structure channels, and

legs having their tops bearing the webs of the splicing means channels, thereby supporting the entire conveyor,

whereby rotation of the rollers causes cards having their longitudinal edge margins seated in the chamfers of the rollers to be propelled along the bed.

4,174,105

PLAYER ACTUATED FLYING TOY

Burton C. Meyer, Downers Grove, and Alan A. Hicks, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,405
Int. Cl.[2] A63H *27/04*
U.S. Cl. 272—31 A **3 Claims**

1. An action toy having an airplane rotated at a speed and elevation as controlled by a player of the toy, comprising:

a base including an enlarged platform area defining a playing surface generally below the area of movement of the airplane;

a generally vertical rotatable shaft mounted at the center of the playing surface;

a support arm pivotally connected to the top of said shaft having the airplane connected to a first end of said arm;

a centrifugal elevating means mounted at the opposite end of said arm at an angle relative to the length of the arm;

a rotatable drive gear secured to the bottom of said shaft, generally below said platform;

a first plate slidably mounted on said base for reciprocal sliding movement generally transverse to said shaft;

manually operable means mounted exteriorly of the periphery of said platform to permit reciprocating of said first plate by a player of the game;

a drive plate mounted on said first plate including a pair of sets of teeth for engaging and rotating said gear, a first set of said teeth engaging and rotating said gear upon movement of said drive plate in a first direction and a second set of teeth for engaging said gear upon movement of said drive plate in a second direction; and

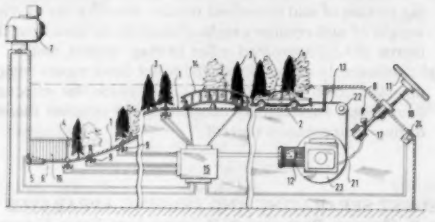
lost motion means between said first plate and said drive plate for moving said drive plate, in response to operation of said manually operable means for engaging the respective set of teeth with said gear whereby the speed of rotation of said shaft and altitude of said airplane is controlled by the operation of said manually operable means by a player of the game.

4,174,106

GAME OF SKILL

Willi Moser, Unteres Hardt 6a, 8937 Bad Wörishofen, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 846,210
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649381
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—1 E **8 Claims**



1. A game of skill comprising a remotely controlled toy or model vehicle, for example an automobile, movable along a path of travel having limited boundaries, a central command unit, an arrangement for remotely controlling the operation of said vehicle, and a photographic device disposed for taking a picture of a person operating said remote control arrangement, said path of travel having in the vicinity of its end part a switch contact which is operable by said vehicle to trigger said photographic device, wherein said path of travel is constituted by a transparent plate and photoelectrical cells are disposed beneath said plate in positions defining the boundary of the path of permitted travel and are connected to said command unit, light sources being disposed above the plate and said path of travel, whereby an operating signal will be produced at said command unit in response to trespass of said vehicle from the prescribed path of travel.

4,174,107

TETHERED BALL TENNIS PRACTICE DEVICE

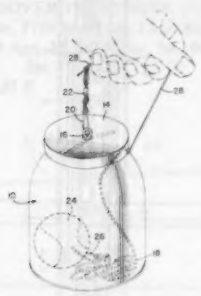
Robert B. Hickey, Pembroke Pines, Fla., assignor to George L. Mitchell, Miami, Fla.

Filed Aug. 31, 1977, Ser. No. 829,295
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A **8 Claims**

1. A tennis practice device comprising:

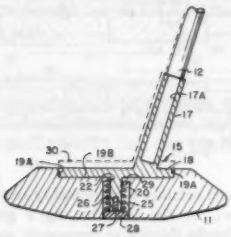
a hollow container adapted for receiving a weighting material;

a lid threadably attached to said container for enclosing said weighting material;
an elongated elastic line;
means for attaching one end of said elastic line to said lid;
a tennis ball; and,



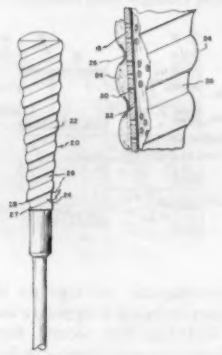
means for attaching the other end of said elongated elastic line to a tennis ball;
the threads of said lid being adapted to permit said elastic line to pass therebetween without damaging said elastic line when said lid is threadably attached to said container.

4,174,108
ADJUSTABLE GOLF PUTTER
Orville A. Reinholz, 4899 Campbell Ave., Apt. #2, San Jose, Calif. 95130
Filed Apr. 27, 1978, Ser. No. 900,604
Int. Cl.[2] A63B *53/06*
U.S. Cl. 273—79 **7 Claims**



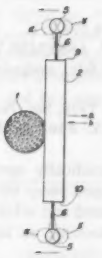
1. An adjustable golf club comprising in combination:
a shaft having a rigidly-connected substantially right angularly disposed planar member attached thereto at one end, said planar member extending in at least two directions from the shaft;
a head having a top surface forming a recess sized to receive said planar member with the top surfaces substantially coinciding with the same plane and align said shaft with the head for hitting a golf ball;
a stub shaft rigidly fixed to the surface of the planar member opposite the shaft such that when the planar member is positioned to fit into the recess, said stub shaft extends substantially normal to said planar member at a position intermediate the planar member ends;
said head including a well opening into said recess and positioned to receive said stub shaft when the planar member is seated in the recess;
means to lock and spring-load said stub shaft in said well to spring-load said planar member in said recess; and
said head having surfaces on two sides configured to strike the ball whereby by moving the head relative to said shaft to unseat the planar member from the recess, the head can be rotated one hundred eighty degrees and the planar member repositioned in the recess to allow hitting the ball with either surface.

4,174,109
ADHESIVELY BONDED HAND GRIP SLEEVE FOR HAND TOOLS AND THE LIKE
Conrad J. Gaiser, 24 S. 66th Pl., Long Beach, Calif. 90802
Filed May 10, 1978, Ser. No. 904,538
Int. Cl.[2] A63B *53/14*
U.S. Cl. 273—81.6 **7 Claims**



1. A manual tool having a handle with a hand grip for grasping by a user and a cover member comprising a porous tape spiral wrap about said handle with a continuous open-edge seam between adjacent tape wraps and being secured to said handle by an adhesive tape spiral wrap overlying said open-edge seam and adjacent edges of said porous tape thereby resulting in a gripping surface of interspaced spiral wraps of said adhesive tape and said porous tape, said porous tape formed of a reticulated plastic foam.

4,174,110
INERTIA BALANCED GOLF CLUB
Zenzo Yamamoto, 2-40-3, Okuzawa, Setagaya-ku, Tokyo, Japan
Filed Feb. 10, 1978, Ser. No. 876,707
Claims priority, application Japan, Apr. 21, 1977, 52/46252
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—169 **4 Claims**



1. A golf club, comprising:
a head having a striking face;
two weights, respectively disposed with respect to said head adjacent to the toe and heal of the head; and
connecting means comprising at least one resilient element, for swingably connecting said weights to said head in such a manner that said weights are independently swingable, with respect to said head when the club is in use, at a right

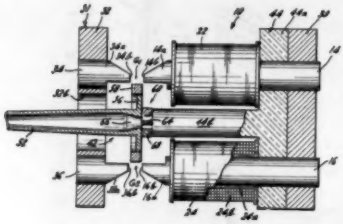
angle to the longitudinal axis of said head in a plane perpendicular to the plane of the striking face of the head.

4,174,111

COMPRESSIVE PIVOT SUSPENSION SYSTEM FOR AN ELECTROMAGNETIC CARTRIDGE

Joseph F. Grado, 4614 Seventh Ave., Brooklyn, N.Y. 11220

Continuation of Ser. No. 414,983, Nov. 12, 1973, abandoned.
This application Sep. 12, 1975, Ser. No. 612,770
Int. Cl.[2] G11B *3/52*
U.S. Cl. 274—37 **11 Claims**



1. An electromagnetic cartridge for the reproduction of sound recordings including a support, a magnetic structure on said support including first, second, third and fourth pole pieces and a front magnetic member defining first and second operating gaps and third and fourth operating gaps, said first and second operating gaps extending symmetrically of a first plane and said third and fourth operating gaps extending symmetrically of a second plane and substantially at right angles to the first plane, a coil mounted on each pole piece, the coils for said first and second operating gaps being connected in series and the coils for the third and fourth operating gaps being connected in series, a rigid stylus lever having an interior wall and disposed symmetrically of said operating gaps having a stylus proximate one end, generator means rigidly and operatively connected to said stylus lever and disposed symmetrically with and proximate to said operating gaps, means for supending said stylus lever from said support including an elastomeric socket member formed on the interior wall of said stylus lever, a pivot member operatively connected to said support and operatively disposed in said elastomeric socket member and means operatively disposed between said stylus lever and said support and arranged to urge said pivot member to bear against said socket member.

4,174,112

SEAL ASSEMBLY

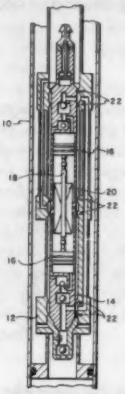
Donald E. Carrens, Tulsa, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 13, 1978, Ser. No. 942,092
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—171 **8 Claims**

1. In a downhole hydraulically operated pump having a generally cylindrically shaped pump body which has an annular seal assembly therearound and which is mounted within a bore in a hollow pump housing, an improved seal assembly comprising:

(a) a cross-sectionally generally dovetail shaped groove around said pump body; and

(b) an annular seal element mounted in said groove and having an inner surface resting adjacent to the bottom of said groove, an outer portion including an outer peripheral sealing surface extending from one end thereof over a major portion of the exterior of said seal element, and a lip formed at the opposite end thereof by a recess around the outer perimeter thereof which undercuts a segment of said seal ring at that end portion thereof, said lip being shaped so that fluid pressure acting toward the end of said seal



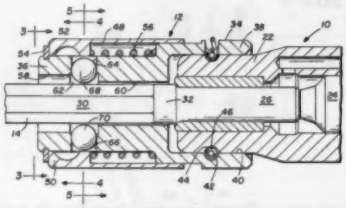
element having said lip will bias said lip outward into sealing engagement with the pump housing.

4,174,113

BIT RETAINER FOR PNEUMATIC TOOLS

Richard E. Eckman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 8, 1978, Ser. No. 904,136
Int. Cl.[2] B25D *17/08*
U.S. Cl. 279—19.4 **6 Claims**



1. An improved retainer for releasably securing bits, such as chisels, chippers, or the like, having a generally elliptical flange on the shanks thereof in pneumatic tools comprising:

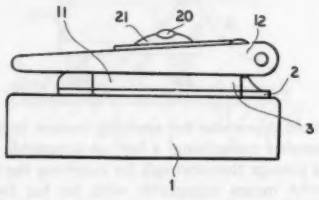
a retainer body including a nose end and a rear end arranged for connection to the pneumatic tool, said body having a bore extending axially through said ends for receiving the bit, said bore having a front portion of generally elliptical cross-section to receive the elliptical flanges, an intermediate portion of generally circular cross-section of a diameter at least equal to the major axis of said front portion, and a rear portion of approximately the same cross-section as said front portion, said rear portion having a major axis disposed at an angle relative to the major axis of said front portion and said body also having a pair of radially disposed ports intersecting the intermediate portion of said bore;

a bit latching member movably located in each of said ports; and,

an annular sleeve slidingly positioned on said body for movement between latched and unlatched positions, said sleeve including an inwardly extending flange portion for engaging said latching members when said sleeve is in a latched position to limit the space between said members to a distance approximately equal to the minor diameter of the bore in said front portion, said sleeve having a groove in the interior thereof for receiving said latching members when said sleeve is in an unlatched position to permit

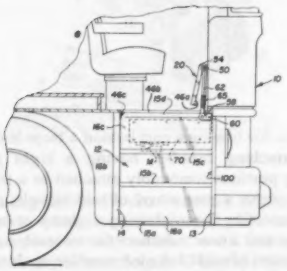
radial movement of said latching members to a position wherein the space therebetween is at least equal to the major axis of the front portion of said bore.

4,174,114
CROSSOVER PREVENTER FOR SKIS
Hans Hinterholzer, 5759 Saalbach, Land Salzburg, Austria
Filed Apr. 20, 1978, Ser. No. 898,417
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **8 Claims**



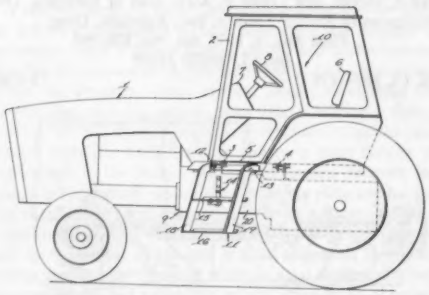
1. An anticrossing device for a ski comprising:
a base plate adapted to be fixed on an upper surface of said ski;
a support body pivotally mounted on said base plate;
a stirrup-shaped barrier member swingably mounted on said support body and defining an axis therewith about which said barrier member is swingable into an upright position limiting crossing of skis;
spring means on said support body for biasing said barrier member into said upright position; and
indexing means between said base plate and said support body for indexing said support body selectively in one of three positions, two of the indexable positions having said axis parallel to the longitudinal edges of the ski and the third indexable position having said axis transverse to said longitudinal edges.

4,174,115
MOTORIZED BI-FOLD STEPWELL COVER
John W. Youngblood, 3201 Franklin, Waco, Tex. 76710
Filed Dec. 27, 1977, Ser. No. 864,461
Int. Cl.[2] B60R *3/00*
U.S. Cl. 280—163 **10 Claims**



1. In a vehicle having steps in a stepwell, a stepwell cover comprising: inboard and outboard deck segments; means pivotally securing the inboard deck segment adjacent an upper end of a side of the stepwell, said inboard deck segment being moveable between a substantially vertically disposed first inboard deck segment position and a substantially horizontally disposed second inboard deck segment position; means pivotally securing said outboard deck segment to the inboard deck segment, said outboard deck segment being moveable between a substantially vertically disposed first outboard deck segment position and a substantially horizontally disposed second outboard deck segment position; a first curved surface; means securing said first curved surface relative to the vehicle; a second curved surface; means securing said second curved surface to said outboard deck segment, said first curved surface having a radius of curvature substantially equal to two times the radius of curvature of the second curved surface; and a flexible tension carrying member extending about said first and second curved surfaces such that movement of said inboard deck segment between said first and second inboard deck segment positions moves said outboard deck segment between said first and second outboard deck segment positions.

4,174,116
ISOLATED STEP SUPPORT
Michael L. Slosiarek, Greenfield, and Gregory A. Krieger, Brookfield, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Jul. 31, 1978, Ser. No. 929,290
Int. Cl.[2] B60R *3/02*
U.S. Cl. 280—163 **10 Claims**

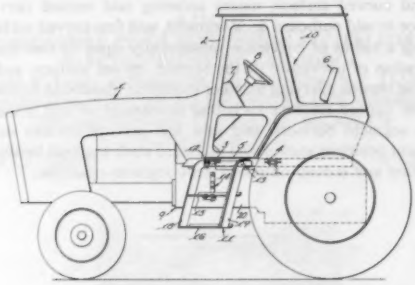


1. A vehicle having an isolated step comprising, a vehicle chassis, a platform, isolators resiliently mounting said platform on said vehicle chassis, a step mounted on said vehicle platform, a stabilizer mounted on said vehicle chassis, isolator means connected between said stabilizer and said step partially supporting said step and dampening vibrations between said stabilizer and said step, said isolator means including fastening means fastened to said stabilizer, securing means secured to said step, and an elastomer consisting of a horizontal elastomeric element extending between said fastening means and said securing means to reduce transmission of vibrations and sound between said stabilizer and said step and provide a cushioned support for said step.

4,174,117
ISOLATED STEP SUPPORT
Michael L. Slosiarek, Greenfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Dec. 22, 1977, Ser. No. 863,337
Int. Cl.[2] B60R *3/00*
U.S. Cl. 280—163 **10 Claims**

1. An isolated step for a vehicle comprising, a vehicle chassis, a vehicle cab, isolators resiliently mounting said cab on said vehicle chassis, a step mounted on said vehicle cab, a step

support mounted on said vehicle chassis, isolator means on said step support supporting said step and dampening vibrations of



said step in at least two directions to thereby reduce vibrations of said step and cab.

4,174,118

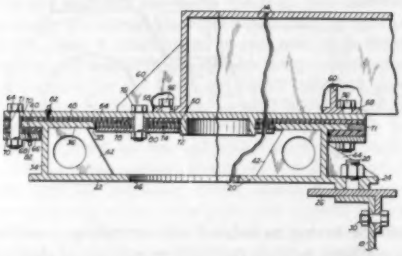
PIVOTAL LOG BUNK SUPPORT FOR VEHICLES

Cecil I. Heyne, and Leelin F. Kirk, both of Estacada, Oreg., assignors to Rowley Trailers, Inc., Estacada, Oreg.

Filed Aug. 1, 1977, Ser. No. 820,790

Int. Cl.[2] B62D *53/08*

U.S. Cl. 280—179 R **5 Claims**



1. A pivotal log bunk for vehicles comprising

(a) a base member arranged to be secured in a fixed position on the vehicle,

(b) said base member having an upright exterior circular peripheral surface and a flat substantially horizontal top surface,

(c) a flat disc member of resinous plastic seated on said top surface and operating with said surface as a load supporting bearing,

(d) a load plate seated on said disc member,

(e) means on said load plate arranged to secure a bunk integrally thereto,

(f) a flange on said base member extending outwardly around an outer portion thereof,

(g) an annular retainer plate engaging under said flange,

(h) an annular resinous plastic disc disposed between said retainer plate and said flange and having edge thrust bearing engagement against said peripheral surface of the base member,

(i) and bolt means releasably securing said load plate and retainer plate together for rotation horizontally on said base member,

(j) said base member and disc member having an extended width so as to provide sole lateral support for a bunk on the load plate.

4,174,119

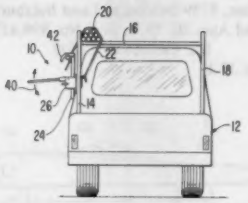
HOLD-DOWN UNIT FOR PICK-UP TRUCK

James A. Biles, 142 McBain Ct., Campbell, Calif. 95008

Filed Jun. 26, 1978, Ser. No. 918,909

Int. Cl.[2] B60P *7/00*

U.S. Cl. 280—179 A **7 Claims**



1. A hold down unit for applying tension to a flexible tie-down member comprising: a bar; an actuatable jacking unit having a passage therethrough for receiving the bar and providing with means engageable with the bar for selectively moving the bar in either of a pair of opposed directions, said jacking unit having means for attaching the same to a side of a vehicle or an upright post of same; and cam means on the bar for urging a tie-down member into frictional engagement with the bar so that, when the bar is moved in one direction upon bar of the jacking unit, tension will be applied to the tie-down member when the opposite end of the tie-down member is secured to the vehicle, said jacking unit being actuatable in reverse to shift the bar in the opposite direction to remove the tension on the tie-down member.

4,174,120

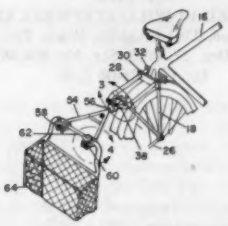
BICYCLE CART ATTACHMENT

Anthony L. Freeman, 1143 5th St., Washington, D.C. 20001

Filed Dec. 28, 1977, Ser. No. 865,179

Int. Cl.[2] B62J *7/04*

U.S. Cl. 280—204 **1 Claim**



1. A device for towing a cart behind a bicycle comprising a U-shaped attaching member having a bight portion and threaded leg portions removably attached to a frame portion and located above a rear wheel of said bicycle, a universally movable connecting means having a clamp at one end with hinged upper and lower members for rotatable attachment to the bight portion of said U-shaped member, an A-shaped frame member having the tip of said A rigidly connected to said universally movable connecting means wherein said A shaped frame member is movable 180 degrees from an extended position to a stored position overlapping said U-shaped attaching member, the legs of said A-shaped frame member terminating in clamping bearing members for movably engaging the handle portion of a cart, and a pair of parallel plates with aligned apertures therein receiving the threaded ends of said leg portions whereby said plates, when positioned on opposite sides of vertical bicycle frame members and bolted thereagainst, will hold the device on said bicycle.

4,174,121

CROSS-COUNTRY BOOT AND SKI BINDING

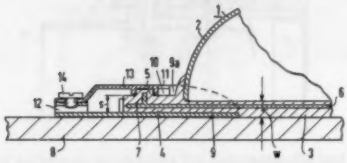
Hans Benseler, Hemmingen, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Feb. 24, 1978, Ser. No. 880,939

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2707887

Int. Cl.[2] A63C 9/00

U.S. Cl. 280—615 16 Claims



1. In combination with a cross-country ski, a cross-country ski boot having an outer sole which includes an extension portion projecting beyond a forwardly located tip of the cross-country ski boot for attaching the ski boot to the cross-country ski, and a transversely oriented rib-like bulge arranged on a top side of the extension portion, wherein a reinforcing insert is arranged in the outer sole of the cross-country ski boot, said insert extending at least from a ball portion of the outer sole into a zone of the rib-like bulge, and a fastening means is arranged on the cross-country ski and has a clamping portion extending over and embracing the rib-like bulge, the cross-section of the clamping portion corresponding to the cross-section of the rib-like bulge, whereby the cross-country ski boot is secured against displacement longitudinally of the ski.

4,174,122

SKI-BINDING DEVICE FOR CROSS-COUNTRY SKIS

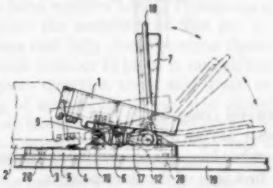
Hans Görlach, Gablonzer Ring 17-19, Kaufbeuren-Neugablonz, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,356

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 7705310[U]

Int. Cl.[2] A63C 9/00

U.S. Cl. 280—615 12 Claims



1. A ski-binding device for cross-country skis comprising a base plate having a longitudinal axis, said plate comprising a block portion, a pivot bearing member, and a forward portion; means for fastening said base plate to a ski, said base plate being oriented with said forward portion towards the tip of the skis; a movable holder element having a forward end, a rearward end and a fulcrum portion, said fulcrum portion being between said forward and rearward ends and being pivotally engaged with said pivot-bearing member of said base plate, said rearward end being shaped to engage from above a front portion of a ski boot and hold the same against said block portion of said base plate; a plurality of upwardly projecting pins replaceably mounted in said block portion for engaging from below the front portion of the ski boot; and tensioning lever means rotationally supported on the forward portion of the base plate and operatively engageable with said forward end of said holder element for holding said rearward end in engagement with the front portion of the ski boot, said forward portion of said base plate having supporting hearing means for supporting and removably retaining said tensioning lever means; said holder element, said base plate, and said tensioning means being made of a synthetic material.

4,174,123

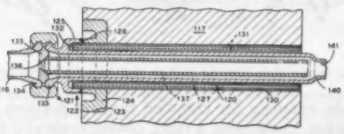
VESSEL PENETRATION APPARATUS

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 626,820, Oct. 29, 1975, Pat. No. 4,124,064, which is a division of Ser. No. 327,349, Jan. 29, 1973, Pat. No. 3,941,187, which is a continuation-in-part of Ser. No. 162,359, Jul. 14, 1971, abandoned. This application Aug. 24, 1978, Ser. No. 936,672

Int. Cl.[2] F16L 59/14

U.S. Cl. 285—47 1 Claim



1. A reactor pressure vessel penetration apparatus for feedwater delivery comprising an inlet feedwater line external to the pressure vessel, a flange formed on the end of the feedwater line that is adjacent to the pressure vessel, a nipple protruding from the pressure vessel surface, means for joining the feedwater line and the nipple, said nipple having a flange formed on the end thereof oppositely disposed to and in axial alignment with the feedwater line flange, a plate having an orifice formed in the center thereof interposed between the flanges, a thermal shield secured to the orifice plate and having an axis that is in general alignment with the orifice, said thermal shield protruding through the pressure vessel, a tube formed on the nipple flange and in axial alignment therewith extending through the pressure vessel in axial alignment about the thermal shield, and a sleeve of several laminations of reflective thermal insulation interposed in an annulus that is formed between the pressure vessel and the tube.

4,174,124

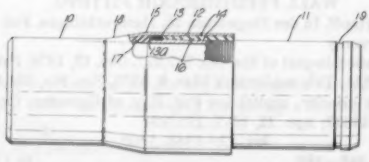
PIPE JOINTS AND CONNECTORS THEREFOR

Basil F. Dockree, Potters Bar, England, assignor to Pipeline Seal and Insulation Co. Ltd., London, United Kingdom

Filed Mar. 24, 1977, Ser. No. 780,830

Int. Cl.[2] F16L 21/02

U.S. Cl. 285—54 19 Claims



1. A connector for a pipe joint for the passage of a fluid comprising inner and outer tubular connecting members, end lengths of which are telescopically engaged and overlapped to define a tubular passage therebetween, the external surface portion at the end of the inner member and the opposed internal surface portion of the outer member being polished; a compressable, cross-sectionally rounded O-ring of electrically insulating material located between the members totally within the overlapped end lengths and compressed between said opposed polished surface portions; and sealing means, compris-

ing a jointing compound of electrically insulating material, cast against the compressable, cross-sectionally rounded O-ring and the opposed surfaces of the connecting members defining said tubular passage to hold the members relative to one another and provide electrical insulation therebetween, said compressable, cross-sectionally rounded O-ring thereby providing a substantially hermetic seal between said members when pressed against said jointing compound by said fluid.

4,174,125
TUBE COUPLING

Walter Wyss, Kappel, Switzerland

Filed Oct. 11, 1977, Ser. No. 840,962
Int. Cl.[2] F16L *17/02*
U.S. Cl. 285—110 **10 Claims**

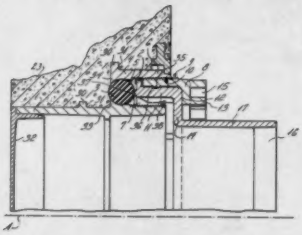
1. A tube coupling for coupling the end portions of two tubes together, comprising a rigid, circumferentially continuous; outer tubular sleeve and an inner tubular seal arranged within said sleeve, said tubular sleeve intended for receiving the respective ones of the two tube end portions, said tubular sleeve having a symmetrical shape relative to its radial median plane and having a bore with a boundary wall defining a plurality of retaining grooves distributed along its length, said seal being a continuous single part which extends substantially over the entire length of said sleeve and is anchored in said retaining grooves, said seal having a seal bore bounding wall being provided adjacent an end of said sleeve with a compression flange, the maximum diameter of said compression flange corresponding at most to the exterior diameter of the tube to be joined, the said diameter of said compression flange decreasing in an axial inward direction to form one face of said compression flange which is adapted to contact the tube, the axially inward end of said compression flange having an undercut steep face, said seal member having a recess portion of greater diameter than said tube to be joined approximately equal in axial length to the length of said steep face and forming a receiving space for the steep face of said compression flange, said compression flange having an axial length greater than the radial height thereof and being adapted to be deflected axially and compressed radially, by insertion of the tube, into the receiving space to project sufficiently to tightly engage and seal with the tube.

4,174,126
WALL FEEDTHROUGH FITTING

Werner Hauff, In den Stegwiesen 18, Herbrechtingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 737,027, Oct. 19, 1976, Pat. No. 4,078,834. This application Mar. 9, 1978, Ser. No. 884,806
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548807; Apr. 22, 1977, 2717951
Int. Cl.[2] F16L *5/00*
U.S. Cl. 285—158 **10 Claims**

1. A feedthrough-fitting assembly comprising:
a wall having a pair of faces;
a feedthrough tube extending along a tube axis and having a pair of opposite axial ends, said tube being imbedded in said wall with its said ends each exposed at a respective one of said faces of said wall;
an annular seal surrounding said tube adjacent one of said ends thereof and radially inwardly engaging said tube, said seal bearing axially against said wall;
a holding ring surrounding said tube at said seal and radially engaging same, said holding ring being fixedly imbedded in said wall and being independent of and spaced radially outwardly from said tube, said holding ring extending axially in one direction beyond said seal toward said one end and having between said seal and said one end an internal screwthread; and

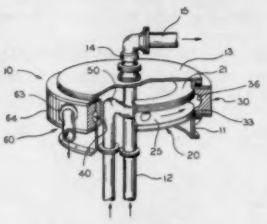


a pressure ring between said holding ring and said tube, threaded into said screwthread of said holding ring, and bearing axially in the opposite direction on said seal, whereby screwing of said pressure ring into said holding ring presses said seal axially in said opposite direction against said wall and deforming said seal radially inwardly and outwardly against said tube and holding ring.

4,174,127
MULTIPORT PIGGABLE FLUID SWIVEL

William R. Carn, Naperville, Ill., and James L. Carothers, Ponca City, Okla., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Apr. 7, 1978, Ser. No. 894,498
Int. Cl.[2] F16L *27/08*
U.S. Cl. 285—190 **17 Claims**



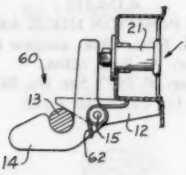
1. A fluid-swivel comprising:
a first member having a first face,
a second member having a second face adjoining and mating with the first face of the first member,
means operatively positioning and holding the first member and the second member to rotate relative to each other about a common axis and with the first face and second face positioned to rotate relative to each other in operative arrangement,
a fluid conduit defined by a first raceway in the first face and a second raceway in the second face opposite the first raceway,
sealing means preventing fluid flow between the first face and the second face and thereby out of the fluid-swivel,
an inlet conduit communicating with the fluid conduit and directed thereto at an angle so as to permit a pipeline pig to travel from the inlet conduit to the fluid conduit,
an outlet conduit communicating with the fluid conduit, and
a pipeline pig guide means extending from the fluid conduit to the outlet conduit to direct a pipeline pig from the fluid conduit to the outlet conduit.

4,174,128

ANTI-RATTLE VEHICLE DOOR LATCH MECHANISM

Wayne G. Styck, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,628
Int. Cl.[2] E05C 3/08
U.S. Cl. 292—127 10 Claims



1. An anti-rattle mechanism for automatically and releasably latching a door to a body for pivotal movement through a given arc from a fully open position to a fully closed position, said mechanism comprising:

(a) first and second rigid support members, one of which is adapted to be mounted on said door and the other of which is adapted to be mounted on said body;

(b) a cylindrical pin rigidly mounted on said first support member and projecting therefrom with the axis of said pin extending normally to said given path of movement of said door;

(c) a cam hook member mounted on said second support member for pivotal movement about a given axis parallel to said axis of said pin;

(d) spring means urging said cam hook member to pivot in a given direction about said given axis; and

(e) actuation means for selectively causing said cam hook member to pivot in the direction opposite said given direction about said given axis;

said second support member having a rigid abutment surface adapted to abut the periphery of said pin when said door is in said fully closed position on that side of the line defined by said axis of said pin and said given axis of pivotal movement of said cam hook member toward which said cam hook member is urged to move in said given direction by said spring means and on the same side of said pin as said given axis of pivotal movement of said cam hook member;

said cam hook member having a camming surface adapted to engage the periphery of said pin as said door approaches said fully closed position thereof causing said cam hook member to pivot in said direction opposite to said given direction about said given axis against said urging of said spring means, said camming surface of said cam hook member terminating in a hooking surface adapted to receive said pin when said door is in said fully closed position thereof and to compressively engage the periphery of said pin under the urging of said spring means at a point which is substantially opposite the abutment of said periphery of said pin by said rigid abutment surface of said second support member.

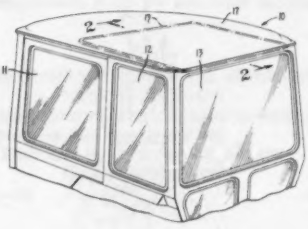
4,174,129

WINDOW LATCH

Marvin W. Schwandt, Brighton, and John F. Hern, Southfield, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 813,042
Int. Cl.[2] E05C 3/26
U.S. Cl. 292—216 10 Claims

1. Latching apparatus for securing a window movable between a closed vertical position and a horizontal latch position within a cab, a roof on the cab and the latch position of said window being beneath the roof of the cab, comprising: cam means and an eccentric axis pivotally mounting said cam means to said roof to cause said cam means to gravitate to an engaging position whenever released from the latch position, pin means interconnecting said window and said cam means by engagement therewith upon movement of said window therepast, and lever means engageable with said cam means to lock said cam means and said window in the horizontally latched position, said lever means including an arm, said cam means including a shoulder, first and second points on said shoulder,



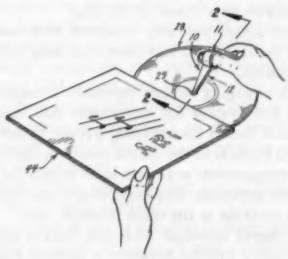
said first point on a closer radius to said cam pivot and the said second point, said arm engaging said shoulder at said first point in the locked position at a distance between said first point and the pivot of said lever greater than the distance between said second point and the pivot of said lever to require raising of said cam means having the weight of the window thereon to permit said lever arm to pass said second point to reach the release position.

4,174,130

RECORD HANDLING DEVICE

Harold Mayfield, 2840 Fortune Dr., Granite City, Ill. 62040

Filed Apr. 21, 1978, Ser. No. 898,693
Int. Cl.[2] B65G 7/12
U.S. Cl. 294—25 16 Claims



1. A handling device for a phonographic record having a spindle hole, the device being for use by a human hand, and comprising:

(a) an extension member;

(b) means at a first end of the extension member for securing the device to the thumb of the hand so that the extension member extends laterally outwardly from the side of the thumb in a direction transverse to the longitudinal axis of the thumb so that pulling force exerted upon the extension member pulls the handling device laterally from the side of the thumb; and

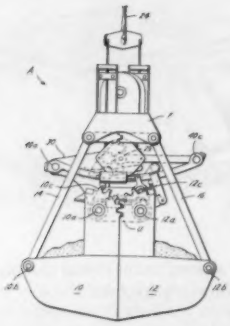
(c) a hook extending downwardly from the second end of the extension member in a direction transverse to the longitudinal axis of the thumb for engaging insertion into the spindle hole.

4,174,131

CLAMSHELL BUCKET APPARATUS AND METHOD OF USING SAME

Richard E. Gregg, Houston, Tex., assignor to Royce Equipment Company, Division of McGinnes Manufacturing Co., Houston, Tex.

Filed Apr. 21, 1978, Ser. No. 898,922
Int. Cl.[2] B66C 3/10
U.S. Cl. 294—70 5 Claims



1. A clamshell bucket apparatus, comprising:

a pair of relatively movable and connected clamshell bucket sections each having a scoop configuration with an inner edge which is adapted to be in contact with the other inner edge when the bucket sections are in the closed position and which are moved apart when the bucket sections are in the open position, said clamshell bucket sections connected for uniform movement to and from the open and closed positions;

operating and hoisting means operably connected with said clamshell bucket sections for manipulating said clamshell bucket sections to and from the open and closed positions and for raising and lowering said bucket sections, said operating and hoisting means including:

a single line system adapted to extend from the clamshell bucket apparatus to a crane or the like;

releasable latch means movably mounted with said bucket sections for movement to and from a latching position and a release position;

movable latch-engaging means operably connected with said single line system for movement into engagement with said latch means for applying a force to said buckets to move said buckets to the closed position, and for movement from engagement with said latch means for supporting the entire apparatus from said single line system with said bucket sections in the open position; and

latch control means mounted with said bucket section and movable relative thereto between a latched position for holding said latch means in the latched position and a releasable position to enable said latch means to move to the release position, said latch control means to hold said latch means in the latched position when said latch-engaging means moves said latch means to the latched position, said latch control means automatically releasing said latch-engaging means from said latch means by slackening of a single line system when said bucket sections are supported on the ground or the like in the closed position;

means for guiding said latch-engaging means as said means moves longitudinally toward and into latch engagement with said latch means; and

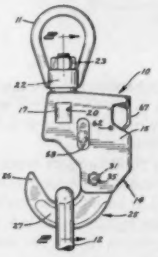
said means for guiding including a pair of parallel and spaced guide arms, each of which is pivotally connected at their lower ends with said clamshell bucket section and pivotally connected at their upper ends with said latch engaging means, each of said guide arms having a central pivot for enabling and guiding the movement of said latch-engaging means relative to said latch means.

4,174,132

MULTIPLE POSITION HOOK ASSEMBLY

Edward J. Crook, Jr., Tulsa, Okla., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed Dec. 20, 1977, Ser. No. 862,390
Int. Cl.[2] B64D 17/38
U.S. Cl. 294—83 R 25 Claims



1. A hook assembly including:

a frame;

a generally arcuate hook member having a hook tip at one end;

means pivotally assembling the hook member to the frame permitting rotation of the hook member with respect to the frame about a hook pivot axis between a closed position with the hook tip proximate a portion of the frame and forming with a portion of the frame a substantially closed, load retaining eye, and an open position for engagement of a load with said hook tip spaced from the frame portion to provide an unobstructed throat between said tip and said frame;

releasable lock means on the frame to lock said hook member in the closed position;

said releasable lock means including a locking member slideably assembled to the frame and fixed for guided movement relative thereto;

said hook member having a shoulder engageable with said locking member;

said lock means being positioned with respect to said frame for movement of said locking member into and out of locking engagement with the shoulder when the hook member is in the closed position;

said locking member including a transverse lock bar having a plane bearing surface engageable with the shoulder, said lock bar being movable with said locking member to a position for engagement with said shoulder after the hook member has been moved to the closed position with said bearing surface in bearing relationship to said shoulder to prevent movement of the hook member toward the open position;

actuator means to move the locking member out of locking engagement with the shoulder to permit rotation of the hook member toward the open position; and

said frame including side plates, said side plates being provided with elongated, parallel and aligned, facing slots, said transverse lock bar of the locking member having transverse ends located in said slots for guided movement of the locking member by said slots and to bear against a part of the frame when the hook member is in the closed position.

4,174,133

FASTENING DEVICE FOR A FIXABLE COVERING

Anton Brockhaus, Rheda-Wiedenbrück, Fed. Rep. of Germany, assignor to Westfalia-Werke Franz Knöbel & Sohne KG, Rheda-Wiedenbrück, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 867,718

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 7700804

Int. Cl.[2] B62P *3/32*

U.S. Cl. 296—26 **2 Claims**

1. A vehicle comprising a fixed roof for the vehicle, the roof having a cutout, a lift roof for covering the cutout, a clamping rail fixed along the edge of the roof cutout, the clamping rail being an elongated member having one arm for attachment to the fixed roof of the vehicle and another arm having symmetrically placed oblique flanges protruding upwardly from the fixed roof, a flexible covering having one edge fixed to the lift roof, and a clamping part fixed to another edge of the flexible covering, the clamping part being an elongated member generally matching the clamping rail in the direction in which the clamping rail is fixed along the edge of the roof cutout, the clamping part having a connecting part folded into a narrow U shape which engages another edge of the flexible covering along the length thereof to fix the edge of the flexible covering to the clamping part, the clamping part also having two symmetrically developed spring clamping arms extending outwardly from the connecting part for forming a hollow space therebetween and then inwardly to form undercuts in the hollow space for engaging the upwardly protruding symmetrical oblique flanges of the clamping rail in order to establish a connection between the flexible covering and the fixed roof of the vehicle.

4,174,134

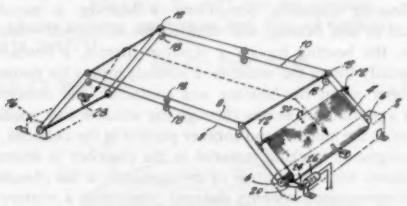
VEHICLE COVER ASSEMBLY

Joseph S. Mathis, Rt. 3, Box 315, Cantonment, Fla. 32533

Filed Nov. 30, 1977, Ser. No. 855,824

Int. Cl.[2] B60J *7/20*

U.S. Cl. 296—136 **5 Claims**



1. A vehicle cover assembly comprising a housing disposed adjacent a first end of a enclosed passenger compartment of a vehicle having a hard, rigid roof with side rigid windows with rain gutters along its sides at its roofline above the windows, a roller disposed in said housing, a flexible shade disposed on said roller, conveyor wheels attached to said roller at either end thereof, conveyor lines mounted on said wheels, said shade being connected to said conveyor lines, intermediate bracket means mounted on upper, exterior portions of the passenger compartment to the rain gutters of the vehicle and end bracket means mounted adjacent the passenger compartment at a second end thereof, conveyor spools mounted on each said bracket means and having said conveyor lines mounted thereon, said shade being movable out of said housing and along said conveyor lines over and above the roof of the vehicle to the passenger compartment second end to cover the passenger compartment at the top and either end thereof.

4,174,135

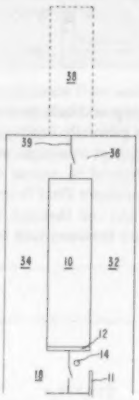
UNDERGROUND FORMED WALL SINGLE-ENTRY MINING METHOD

James D. Grenia, Concord, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 10, 1978, Ser. No. 894,668

Int. Cl.[2] E21C *41/00*

U.S. Cl. 299—11 **18 Claims**



1. In the underground mining of relatively thin mineral seams, a method for forming at least one supporting wall for supporting the overburden above said seam and providing access areas adjacent said supporting wall for mining said seam and providing ventilation, said method comprising:

providing a first access area adjacent a face of said seam;

from said first access area, driving transverse to said seam at least a portion of the width of said seam a first drift of substantially self-supporting dimensions and about the height of said seam;

substantially filling said first drift with a flowable and cureable wall forming material;

curing said wall forming material to form a first wall; and

excavating a tunnel adjacent to and completely about said wall to form a loop with said first access area and provide a second access area behind the rear end of said wall.

4,174,136

SHOCK ABSORBING DEVICE FOR SLIDING BEARINGS

Göran Hällstedt, Floda, Sweden, assignor to Aktiebolaget SKF, Göteborg, Sweden

Filed Dec. 14, 1977, Ser. No. 860,335

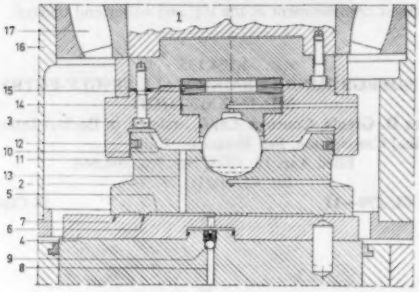
Claims priority, application Sweden, Jan. 18, 1977, 7700451

Int. Cl.[2] F16C *17/00*

U.S. Cl. 308—5 R **2 Claims**

1. A device mounted between a machine member and a base adapted to absorb shock loads which the machine member is subjected to comprising a first element confronting the base, means defining a first chamber between the first element and base of a predetermined cross sectional area, means defining throttling slots between said first element and base, means for

supplying a fluid under pressure to said first chamber, a second element mounted between the machine member and said first element and spaced from the latter to define a second chamber in fluid communication with said first chamber, the cross sectional area of said second chamber being less than said predetermined cross sectional area of said first chamber, a ball mounted in a spherical seat in said first element, a piston in said



second element engaging said ball on the side thereof opposite the seat, biasing means normally urging said piston against said ball and operable to support a predetermined load, shock loads from said machine element in excess of said predetermined load causing flow of pressure fluid from said second chamber to said first chamber and out through said throttling slots to thereby prevent contact between said first element and base.

4,174,137

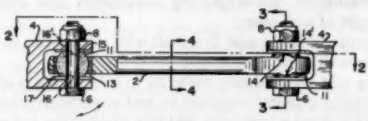
CONTROL ROD ROLL-OVER LIMITER

Donald L. Ferris, Newtown, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 826,610, Aug. 22, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,704

Int. Cl.[2] F16C *9/06*

U.S. Cl. 308—72 **4 Claims**



1. In a control linkage assembly including a control rod with an end provided with an aperture therethrough having an annular perimeter, a spherical bearing within said aperture in the form of a race and a ball with a shaft thru its center rotatably retained within said race, and a clevis secured to the control rod end by a bolt thru said shaft, roll-over stop means comprising a boss member mounted on the control rod end adjacent the aperture for abutment with the clevis to limit movement of the control rod about its longitudinal axis, said boss member being in the form of a segment of a circle disposed in a plane substantially parallel to the longitudinal control rod axis, but perpendicular to the lateral control rod axis with the circle center coincident with the center of the ball of the bearing to permit a full range of control rod movement about its translated and lateral axes.

4,174,138

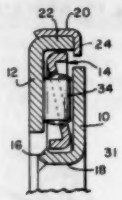
THRUST BEARING AND SEPARATOR

Dean E. Johnston, Thomaston, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Aug. 28, 1978, Ser. No. 937,548

Int. Cl.[2] F16C *33/46*

U.S. Cl. 308—235 **4 Claims**



1. A separator for use with a thrust bearing comprising: a single integral annular member including a radially inner annular flange extending in one longitudinal direction, a radially outer annular flange extending in the opposite longitudinal direction from said radially inner annular flange, an inclined annular wall interconnecting said two flanges, the free end of each flange not extending axially outward from the inclined annular wall further than the radial plane through the axially outermost surface of the radially opposite periphery of the separator; and a plurality of circumferentially spaced rolling member pockets, each extending at least partially along the inclined wall of said single member.

4,174,139

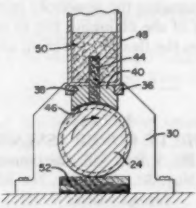
BEARING ASSEMBLY WITH IMPROVED CONTACTOR

Martin L. Abel, Franklin, Mich., assignor to Permawick Company, Inc., Detroit, Mich.

Filed Oct. 1, 1975, Ser. No. 618,337

Int. Cl.[2] F16C *1/24, 33/10*

U.S. Cl. 308—125 **10 Claims**

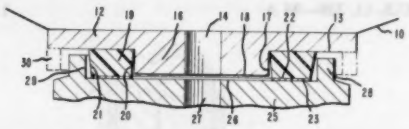


1. Bearing assembly comprising a bearing, a member mounted in said bearing and adapted for movement relative thereto, the bearing having a window therein, a contactor substantially filling the window, a housing means for defining a chamber about the bearing and contactor, the contactor having a portion projecting through the window to a position adjacent to the member and another portion in the chamber, an oil-impregnated wicking material in the chamber in intimate engagement with the portion of the contactor in the chamber, the oil-impregnated wicking material comprising a mixture of oil and oil retaining particles, the contactor comprising a dimensionally-stable, essentially nonabsorbent, resilient solid mass of a plurality of fibrous particles bonded together with an interconnected network of pores therein, the pores being generally smaller than the interstices between the particles which make up the wicking material so that the lubricant in the wicking material will be drawn into the pores in the contactor by capillary action and transferred to said member.

4,174,140
RESILIENT CENTER PLANE ASSEMBLY

William H. Bogar, Newark, and Howard D. Irwin, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 13, 1977, Ser. No. 832,974
Int. Cl.[2] B61F 5/16; F16C 17/04, 27/08; F16F 1/44
U.S. Cl. 308—137 12 Claims



1. A railway car body center plate assembly which comprises:

(a) a metal base plate having a flat surface on its underside, and a centrally disposed, circular, vertical hole adapted for receiving a king pin;

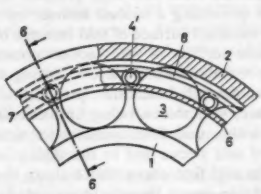
(b) a circular, metal, partial center plate integral with the base plate and having a flat, bottom, horizontal surface, said partial center plate extending downward from the flat surface on the underside of the base plate adjacent to and encircling the centrally disposed hole, and having a substantial diameter; and

(c) a single, annular, homogeneous, solid, synthetic elastomeric pad having a centrally disposed, circular, vertical opening and horizontal and vertical bearing surfaces, said elastomeric pad being positioned concentrically around and adjacent to the partial center plate in contact with the flat surface on the underside of the base plate, having a substantial diameter adapted to substantially fill the space between the partial center plate and a truck center plate flange with sufficient clearance that, under vertical load, the elastomeric pad contacts the vertical surfaces of less than both of the partial center plate and the truck center plate flange, and having a thickness adapted such that the bottom of the horizontal bearing surface, under load, is lower than the bottom edge of the partial center plate and the elastomeric pad substantially vertically overlaps the truck center plate flange, whereby said elastomeric pad is adapted to transmit all the weight from the body center plate assembly to the truck center plate and to transmit all horizontal forces between the partial center plate and the truck center plate flange.

4,174,141
ROLLER BEARING WITH SYNCHRONIZED CAGE RING AND STABILIZING RING

Karl Reiss, c/o Dr. Bernhard H. Geissler, 1321 Hampden Rd., Bartlesville, Okla. 74003

Filed Sep. 23, 1977, Ser. No. 836,038
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643773
Int. Cl.[2] F16C 19/40
U.S. Cl. 308—206 2 Claims



1. A roller bearing comprising

(a) an inner ring having an outer roll surface with an outer roll radius RI,

(b) an outer ring having an inner roll surface with an inner roll radius RA,

(c) a plurality of supporting rollers arranged between said inner ring and said outer ring and having a diameter of approximately the difference between the inner roll radius and the outer roll radius,

(d) one separating roller arranged between every two neighboring supporting rollers such as to contact them and keep them separate, said separating roller, having a first roll area with a first radius **r4** in which the separating roller engages with the supporting rollers and at least one second roll area with a second roll radius r, with the axis of all the separating rollers arranged outside of a cylinder defined by the path of the axis of the supporting rollers,

(e) a cage ring being concentric to the inner and outer ring and being rigidly connected to the outer ring and having a roll area with an outer cage roll radius RK_a in which the cage ring contacts the second roll area of the separating rollers, the radii being defined by the equation

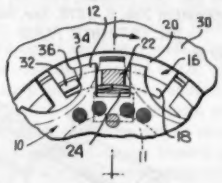
$$(r/r_4)=(RK_a/RA), \text{ and}$$

(f) a stabilizing ring separate from said cage ring and concentric to the inner and outer ring and having an inner roll surface contacting the separating rollers and holding said separating rollers together.

4,174,142
BRUSH MOUNTING FOR ROTARY ELECTRICAL JOINT

Carl A. Pesce, Oak Lawn; Ralph J. Trnka, Dolton, and Robert A. Winkless, Oak Lawn, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,978
Int. Cl.[2] H01R 39/00
U.S. Cl. 339—5 R 10 Claims



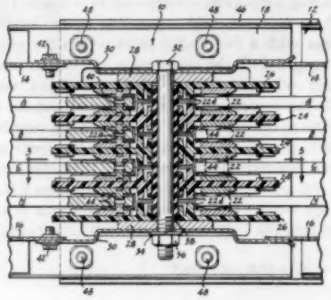
1. In a rotary electrical joint of the type including a fixed hub carrying at least one brush and a rotary member having an inner cylindrical surface contacting the brush, a brush mounting for eliminating uneven wearing of the brush, said brush mounting comprising resilient means disposed between said hub and said brush urging said brush radially outwardly, said brush having a leading edge and a trailing edge in accordance with the intended direction of rotation of the rotary member and cooperating restraining means on said brush adjacent said leading edge and carried by said hub for restraining rotary movement of said brush leading edge with said rotary member in response to a drag force applied to said brush by said rotary member when rotating.

4,174,143

BUS DUCT JOINT EMPLOYING LIGHTLY-LOADED MULTIPLE-POINT ELECTRICAL CONNECTOR

Loy A. Hicks, Jr., Cedarburg, and James J. Rusenko, Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 29, 1976, Ser. No. 671,603
Int. Cl.[2] H01R 9/12
U.S. Cl. 339—22 B 15 Claims



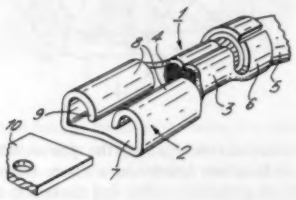
4. In combination, a first and second bus duct each having a plurality of bus bars and a joint assembly electrically interconnecting the individual bus bars of said first bus duct to corresponding ones of said bus bars of said second bus duct, said joint assembly comprising: a plurality of electrically conductive members correspondingly aligned with said bus bars, insulating means disposed between ones of said electrically conductive members associated with adjacent bus bars, and means securing said electrically conductive members and said insulating means rigidly together to form a solid joint assembly independent of connection thereof to the bus bars of either of said first or second bus ducts.

4,174,144

HOUSING FOR AN ELECTRICAL TERMINAL

Roger Le Helloco, Herblay, France, assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 769,986, Feb. 18, 1977, abandoned.
This application Feb. 6, 1978, Ser. No. 875,370
Int. Cl.[2] H01R 11/02
U.S. Cl. 339—59 R 1 Claim



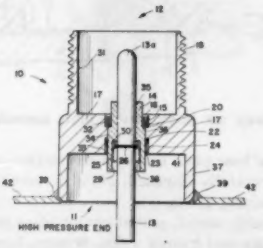
1. A housing of resilient, non-conductive material for receiving varying sizes of electrical terminals comprising, a pair of spaced, parallel side walls joined by resilient top and bottom walls to define a passage through the housing, said top and bottom walls sloping in from either side wall towards the housing's center line in a generally V-shape, so that upon inserting an electrical terminal having a greater dimension than the passage, the passage may expand by the two generally V-shaped, top and bottom walls tending to straighten out.

4,174,145

HIGH PRESSURE ELECTRICAL INSULATED FEED THRU CONNECTOR

Joseph E. Oeschger, Palo Alto, and James E. Berkeland, San Jose, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 29, 1976, Ser. No. 755,510
Int. Cl.[2] H01B 17/26; H01R 7/02
U.S. Cl. 339—94 A 11 Claims



1. In an hermetically sealed electrical connector having a ceramic insulating block supported within a body bore through the metallic body of said connector and at least one conductive pin extending through an axial insulator bore in said ceramic block, said connector being adapted for installation through the wall of a pressurized vessel whereby said pin, said body and said ceramic block each have a high pressure end and an external end, the combination comprising:

first means forming an internal body shoulder facing said high pressure end adjacent and within the external end of said body bore;

second means integral with said ceramic block forming a radially external shoulder which bears against said internal body shoulder in response to thrust force generated by pressure at said high pressure ends;

third means comprising an insulator counterbore extending into said high pressure end of said ceramic block by a predetermined distance, said insulator counterbore being of larger diameter than said conductive pin to generate a first annular cavity surrounding said pin within said insulator counterbore;

fourth means comprising a cup-shaped metal member with a central hole in the base thereof, said conductive pin passing axially therethrough, said cup-shaped member having a relatively thin rim directed outward at said high pressure end and in contact with the inside surface of said counterbore, said base of said member bearing against the internal shoulder generated within said ceramic block by said insulator counterbore;

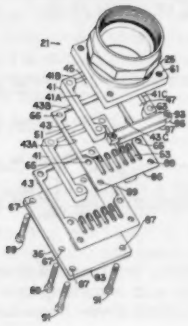
hermetic seals effected by brazing of said cup-shaped member rim to the inside surface of said insulator counterbore and said base of said member to said conductive pin about said hole;

and additional seal and expansion compensating means including a first counterbore into said metallic body a predetermined distance from said high pressure end, said first counterbore providing a second annular cavity between the radially outward surface of said ceramic block and the radially inside surface of said second counterbore, and including a resilient metallic sleeve having a wall thickness less than the radial clearance provided in said second annular space, said sleeve being hermetically brazed to said body within said first counterbore along one axial extremity of said sleeve and to the wall of said ceramic block within said first counterbore along the other axial extremity of said sleeve, thereby to provide for differential expansion of said ceramic block and said metallic body by resilient deformation of said sleeve.

4,174,146
ADAPTER FOR ROUTING ELECTRICAL WIRES

Robert A. Williams, 55 Bounty Rd., East, Fort Worth, Tex. 76116

Filed Jun. 16, 1978, Ser. No. 916,283
Int. Cl.[2] H01R 13/46
U.S. Cl. 339—143 R 3 Claims



1. An adapter for routing electrical wires to a connector, comprising:

an annular socket means having a rectangular shaped base with an opening formed through said base in alignment with the opening of said socket means,

a rectangular shaped end plate,

at least one rectangular shaped spacer having a central opening and a side opening extending from one side to said central opening,

said central opening being generally rectangular in shape and defined by three straight edges, one of which is opposite said side opening and the other two being parallel to each other and perpendicular to said one end,

at least one rectangular shaped shield connecting member having a central opening and a plurality of spaced apart tab members extending from one side toward said central opening,

said central opening of said shield connecting member being generally rectangular in shape and defined by three straight edges and said tabs, one of said straight edges being opposite said tabs and the other two being parallel to each other and perpendicular to said one edge,

said spacer and said shield connecting member being adapted to be located between said base of said socket means and said end plate in an operative position with their central openings in alignment with said openings of said socket means and said base and with said tab members of said shield connecting member in alignment with said side opening of said spacer,

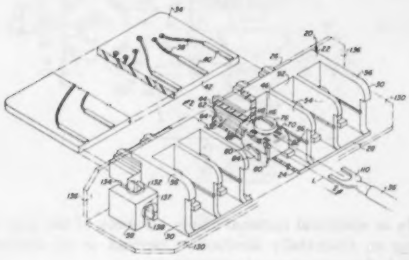
each of said base, spacer, shield connecting member and end plate having four apertures formed therethrough defining the four corners of a square whereby said four apertures of said base, spacer, shield connecting member and end plate respectively are in alignment for receiving connecting means when said spacer and said shield connecting member are located between said base and said end plate in said operative position,

the side opening of said spacer being adapted to receive electrical wires of the type having shields, for routing through said openings of said base and socket means with said shields being connected to said tab members.

4,174,147
CIRCUIT PANEL CONNECTOR

William T. Waddington, Fanwood, and Charles F. Mazzeo, Scotch Plains, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 773,188, Mar. 1, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,728
Int. Cl.[2] H01R 13/12
U.S. Cl. 339—176 MP 6 Claims



1. A circuit panel connector for enabling connection of the circuit terminals along the edge of a circuit panel, such as a printed circuit board, with external conductors, said panel connector comprising:

a unitary block of dielectric material having a base, a front, a back opposite to the front, and opposite sides;

an elongate socket in the block extending between the opposite sides thereof and open at the front thereof for receiving the panel edge;

a number of recesses extending from the back toward the front of the block, a pair of barriers associated with each said recess, one said barrier of each adjacent pair of barriers having guide means in its associated recess;

a like number of openings extending from the front toward the back of the block, each opening communicating with the socket and with a corresponding recess, each opening being aligned along a straight line with a recess such that each opening and its corresponding recess establish a cavity passing through the block from front to back thereof, each cavity having upper and lower walls;

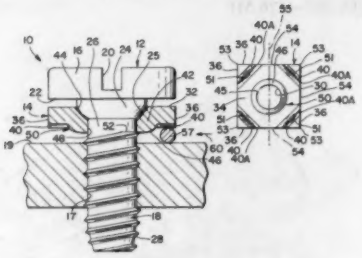
a plurality of electrical contact members, each received within a different recess of the block, the contact members each including upper and lower tines juxtaposed, respectively, with the upper and lower walls of the corresponding cavity and extending parallel to the straight line into the socket, a strap portion unitary with the tines, a selective terminal portion having a platform unitary with the strap portion and a clamping screw threaded into the platform for selective movement toward and away from the platform for selectively connecting and disconnecting the external conductor and the terminal portion with the external conductor entering the respective recess from the back toward the front of the block, each said contact member being of either a first configuration wherein the platform thereof lies in a plane parallel to the straight line and said contact member of said first configuration interengages and is located and guided by a portion of said guide means or a second configuration wherein the platform thereof lies in a plane making an acute angle with the straight line, with the platform thereof facing upwardly and toward the back of the block and said contact member of said second configuration interengages and is located and guided by a different portion of said guide means; and

means securing the contact members in the block against movement along the straight line.

4,174,148
ELECTRICAL TERMINAL CLAMP ASSEMBLY

Edward A. Obuch, Linden, and Paul T. Filak, Roselle Park, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,417
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—246 14 Claims



1. In an electrical terminal clamp assembly of the type for holding an electrically conductive element to an electrical terminal, the improvement comprising:

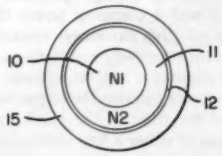
(a) a screw including a head and a partially threaded shank extending from said head, said head being provided with a convex-shaped bearing portion; and

(b) a plate having a first surface and a second surface, said second surface being adaptable for holding said electrically conductive element between said second surface and a surface of said terminal without slipping, said plate also having race means adaptable for receiving therein said shank, said race means having a concave-shaped seating surface on said first surface of the plate for seating said convex-shaped bearing portion of said head, said race means defining a convex-shaped collar means for retaining said plate on an unthreaded portion of said shank without interfering with said threaded portion, and wherein said convex-shaped bearing portion of said head and said race means provide a ball joint means for minimizing frictional resistance between said convex-shaped bearing portion and said concave-shaped seating surface.

4,174,149
SECURE FIBER OPTICS COMMUNICATION SYSTEM

James A. Rupp, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 723,263
Int. Cl.[2] H04B 9/00; G02B 5/14
U.S. Cl. 350—96.33 10 Claims



1. A secure fiber optics communication system comprising:

an information transmitter for the generation of an information signal;

an information receiver for receiving said information signal;

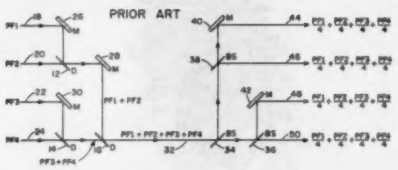
an optical fiber having a frangible glass coating therearound, connecting said information transmitter and said information receiver for the transmission of said information signal, said frangible glass coating comprising glass having high internal stresses; and

means for disabling said information transmitter upon an attempt to penetrate said optical fiber.

4,174,150
SYSTEM FOR COMBINING LASER BEAMS OF DIVERSE FREQUENCIES

Robert S. Congleton, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 660,649, Feb. 23, 1976, abandoned.
This application Mar. 3, 1978, Ser. No. 883,248
Int. Cl.[2] G02B 27/10
U.S. Cl. 350—174 14 Claims



1. A system for combining laser beams of diverse frequencies into a plurality of beams, each comprising laser radiation having components of each of said diverse frequencies, said system comprising:

a plurality, greater than two, of sources of laser radiation including at least first and second source sets;

said plurality of sources of laser radiation providing repsective input beams of laser radiation of different frequencies;

a first plurality of beam splitting elements positioned to receive on one surface of each radiation input beams from said first source set and to receive on the second surface of each the radiation input beams from said second source set;

said first plurality of beam splitting elements providing a plurality of sets of composite beams of radiation comprising:

a first set of composite beams including a fraction of the radiation from said first source set superimposed on a fraction of the radiation from said second source set; and

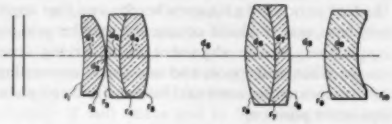
a second set of composite beams comprising a fraction of the radiation in said first source set superimposed on a fraction of the radiation in said second source set;

a further plurality of beam splitting elements responsive to the plurality of sets of composite beams for providing a set of output beams, each beam thereof having a fraction of the radiation in each of the input beams from said first and second sets of sources.

4,174,151
MICROSCOPE OBJECTIVE LENS SYSTEM

Ken Yonekubo, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,962
Claims priority, application Japan, Apr. 20, 1976, 51-45211
Int. Cl.[2] G02B 9/34
U.S. Cl. 350—175 ML 4 Claims



1. A microscope objective lens system comprising a first positive meniscus lens component having a concave surface on the object side, a second positive cemented lens component, a

third positive cemented lens component and a fourth negative meniscus lens component having a concave surface on the image side, and said lens system satisfying the following conditions:

(1) $1.79 < n_1 < 1.81$
(2) $40 < \nu_1 < 43$
(3) $1.60f < f_1 < 1.63f$
(4) $3.5f < |f_4| < 4.5f$
(5) $1.24f < d_5 < 1.27f$

wherein the reference symbol n_1 represents the refractive index of said first lens component, the reference symbol ν_1 designates the Abbe number of said first lens component, the reference symbol d_5 denotes the airspace between the second and third lens components and the reference symbols f_1, f_4 and f represent focal lengths of said first lens component, fourth lens component and the entire lens system as a whole.

4,174,152

ELECTROCHROMIC DEVICES WITH POLYMERIC ELECTROLYTES

Robert D. Giglia, Rye, N.Y.; John A. Sedlak, and David W. Lipp, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 13, 1978, Ser. No. 877,139
Int. Cl.[2] G02F *1/17, 1/23*
U.S. Cl. 350—357 **7 Claims**

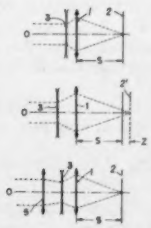
1. An electrochromic device comprising an electrode in contact with a layer of persistent electrochromic material which in turn is in contact with an ion conductive hydrophilic, clear vinyl polymer electrolyte which in turn is in contact with a counterelectrode, and electrical means for selectively applying electrical fields of opposite polarity across said electrodes, wherein the electrolyte comprises a copolymer or partially cross-linked copolymer of 95 to 20% by weight of a vinyl monomer selected from 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, 2-hydroxyethyl acrylate, and 2-hydroxypropyl acrylate and 5 to 80% by weight of an acid-group-containing monoethylenically unsaturated monomer.

4,174,153

VARIFOCAL OBJECTIVE WITH FOCAL LENGTH ADJUSTMENT

François Laurent, Yverdon, Switzerland, assignor to Bolex International SA, Ste-Croix, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,352
Claims priority, application Austria, Nov. 15, 1976, 8501/76
Int. Cl.[2] G02B *15/10, 15/16*
U.S. Cl. 350—184 **28 Claims**



1. In an optical objective including a positively refracting lens assembly centered on an optical axis and adapted to focus incident rays from remote objects upon a receiving surface in line with an image plane located rearwardly of said lens assembly, the combination therewith of focal-length-increasing means for enlarging the image scale of said lens assembly, with consequent rearward displacement of said image plane from a normal position, and a positively refracting supplemental lens member emplaceable on said axis in line with said lens assembly for restoring said image plane to said normal position thereof.

4,174,154

LASER MANIPULATOR APPARATUS WITH DOUBLE PIVOTAL MIRRORS

Harumi Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1977, Ser. No. 791,071
Claims priority, application Japan, Apr. 28, 1976, 51-49190
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—299 **6 Claims**

1. In a manual optical manipulator mechanism including a laser beam source, a freely movable output member having a condenser lens therein for concentrating the laser beam, a plurality of hollow tubular members pivotally coupled between the source and the output member, and a plurality of reflecting mirrors disposed at the pivotal couplings to define a continuous optical beam path within the tubular members, the improvement characterized by:

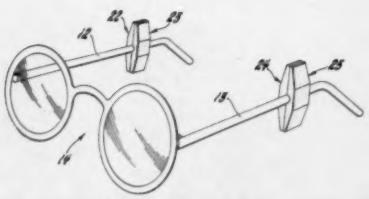
means mounting at least one of said mirrors for rotation about two mutually perpendicular axes, one of said axes being coincident with the incoming laser beam and the other axis being perpendicular to the plane including and defined by the incoming and outgoing laser beams and lying in the plane of the mirror surface, said mounting means controlling the rotation of the mirror such that it rotates about said other axis through an angle equal to one-half of the angular rotation of the outgoing laser beam about said other axis.

4,174,155

SOUND AE ORBING ARTICLE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Sal Herman, 27096 Aberdeen, Southfield, Mich. 48076

Filed Sep. 19, 1977, Ser. No. 834,323
Int. Cl.[2] G02C *11/00*
U.S. Cl. 351—158 **8 Claims**



1. A sound absorbing article for use in conjunction with an eyeglass frame having a pair of temple bar members, comprising:

a main body member fabricated of substantially porous, resilient, flexible, and non-rigid sound absorbing material;

said main body member including a channel formed in a first surface thereof, within which channel a temple bar of said eyeglass frame may be disposed;

adhesive means for securing a second surface of said channel

of said main body member to at least a portion of a temple bar of said eyeglass frame; and

said adhesive means being disposed within said channel provided in said first surface of said main body member.

4,174,156

OPTICAL LENS FOR DIFFERENTIAL CORRECTION

Gilbert Glorieux, 72, rue Achille Viadieu, 31400 Toulouse, France

Filed Oct. 31, 1977, Ser. No. 847,102

Claims priority, application France, Nov. 2, 1976, 76 33208

Int. Cl.[2] G02B *3/12*; G02C *7/06*

U.S. Cl. 351—168 **5 Claims**

1. A convergent optical correction lens comprising a pair of transparent walls defining a closed internal space therebetween, at least one transparent liquid of predetermined index of refraction in a portion of said internal space, said walls being configured so as to establish in said internal space a zone having a reduced thickness, said zone surrounding the optical axis of said lens and having a capillary volume, said liquid being present in the lower part of said internal space when the optical axis is substantially horizontal, and said liquid filling said capillary volume by capillary action when said lens is tilted in relation to the vertical by at least a predetermined angle.

4,174,157

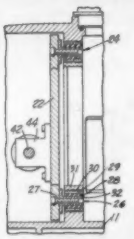
QUIET MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Continuation of Ser. No. 582,698, Jun. 2, 1975, Pat. No. 4,121,886, which is a continuation of Ser. No. 388,630, Aug. 15, 1973, abandoned. This application Feb. 9, 1978, Ser. No. 876,430

Int. Cl.[2] G03B *31/00*

U.S. Cl. 352—35 **2 Claims**



1. In a motion picture camera, the combination of: a housing member having a lens mount, a camera movement assembly enclosed within said housing member, a support member within said housing member, means for mounting the camera movement assembly on said support member, a plurality of sound-absorbing connectors mounting said support member within said housing member, said connectors each having an externally threaded pin free to turn in one of said members, an internally threaded sleeve receiving said threaded pin, an externally threaded bushing, a hollow cylindrical elastomeric liner fixed in an annulus between said bushing and said sleeve, said pin, sleeve, elastomeric liner, and bushing all being coaxial, each externally threaded bushing being received within an internally threaded element on the other said member whereby turning of said bushing within said element, after loosening said pin within said sleeve, provides lateral adjustment of said support member and camera movement with respect to said camera housing and lens mount.

4,174,158

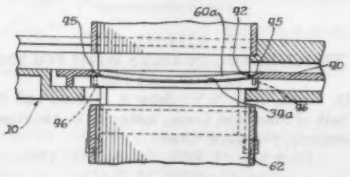
BOWED SLIDE HANDLING APPARATUS

Frank W. Betlejewski, Elgin, and Donald J. Peterson, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,038

Int. Cl.[2] G03B *23/04*

U.S. Cl. 353—113 **5 Claims**



1. An apparatus for controlling the movement of slides in a plane substantially normal to the direction of the movement comprising:

means for receiving a supply of slides having an upper portion for storage and dispensing of photographic slides and a lower portion for accumulating them and a line between said portions of said means lying perpendicular to the photographic surface of the slides;

unidirectional means disposed between said upper and lower portions normal to said line and said unidirectional means including a pair of movable support surfaces in spaced apart relation positioned to engage opposite edges of a photographic slide along their upper distal segments of said surfaces for supporting the parallel extremities of a photographic slide; and

relief means disposed along said distal segments for permitting substantial conjugate disposition in juxtaposed relation of non-planar photographic slides having the central portion thereof curved out of the general plane thereof.

4,174,159

EXPOSURE METER FOR PHOTOMICROGRAPHY

Winfried Kraft, Werdorf; Günter Reinheimer, Biebertal, and Herbert Leiter, Wetzlar, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,477

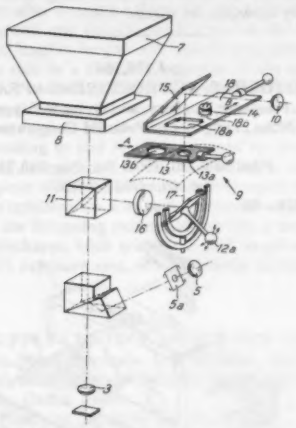
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717033

Int. Cl.[2] G02B *21/00*; G03B *17/48, 7/08*

U.S. Cl. 354—23 R **15 Claims**

1. Photomicrographic exposure meter for a camera attached to a microscope comprising optical means defining a picture-taking beam for microscopic examination of an object positioned on a stage, a beam-splitter located along said picture taking beam and reflecting a part of the picture-taking beam, said part of the picture taking beam projecting an image of said object onto an image plane, a measuring field stop with an aperture for detail or spot measurements located in said image plane, an insertable photo-electric detector positioned downstream of said stop in the direction of and along said part of the picture taking beam, at least one specular means (12,61) reflecting said part of the picture taking beam to said measuring field

stop (13), a gimbal suspension for said specular means, means for displacing said gimbal-suspended specular means (12,61)



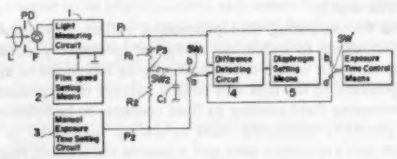
and means for viewing said object detail appearing in said stop aperture.

4,174,160

PROGRAMMED AUTOMATIC EXPOSURE CONTROL CIRCUITRY

Yasuhiro Nanba, Osaka, and Seiji Yamada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japana

Filed Aug. 29, 1977, Ser. No. 828,666
Claims priority, application Japan, Sep. 7, 1976, 51/107609
Int. Cl.[2] G03B *7/08, 17/18*
U.S. Cl. 354—24 **21 Claims**



1. A photographic camera capable of programmed automatic exposure control comprising:

a diaphragm settable to an initial aperture size and capable of being changed to various aperture sizes;

first means for generating a first signal in accordance with the logarithm of light intensity measured through the diaphragm;

second means for generating a second signal in accordance with a given value;

third means responsive to said first and second signals for generating a third signal intermediate said first and second signals with the ratio of the difference between the first and third signals to the difference between the third and second signals being predetermined;

means for setting the diaphragm aperture by determining the difference from the initial aperture size to an aperture size to be set in accordance with one of the differences between the first and third signals and the difference between the first and second signals with the diaphragm at the initial aperture size; and

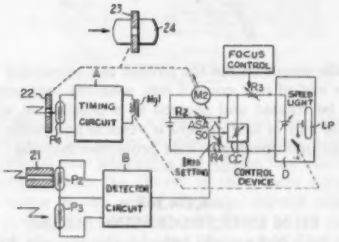
means for controlling the exposure time commensurate with the diaphragm aperture set by the diaphragm aperture setting means.

4,174,161

EXPOSURE CONTROL SYSTEM

Yukio Mashimo, Tokyo; Takashi Uchiyama, and Kanehiro Sorimachi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 414,455, Nov. 9, 1973, Pat. No. 4,063,257, which is a continuation-in-part of Ser. No. 301,779, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 85,438, Oct. 30, 1970, abandoned. This application May 17, 1977, Ser. No. 797,640
Claims priority, application Japan, Nov. 6, 1969, 44-88873; Dec. 27, 1969, 44-1328; Dec. 27, 1969, 44-1329; Sep. 21, 1970, 45-83119
Int. Cl.[2] G03B *7/16*
U.S. Cl. 354—33 **19 Claims**



1. An exposure control system for a scene having a main portion and a remaining portion, comprising

(A) flash illumination means for emitting an auxiliary light to illuminate at least a main portion of a scene to be photographed;

(B) exposure control means including

(b1) exposure aperture means adjustable to an aperture for obtaining an appropriate flash exposure in response to the distance to the main portion, said exposure control means including

(b2) shutter means for providing an exposure for a variable time and for actuating said flash illumination means on a synchronous basis;

(C) control circuit having

(c1) a light receiving element for generating an electrical signal in response to an amount of light from substantially the remaining portion of the scene and

(c2) time defining means for determining the time of said shutter means on the basis of the output of said element and the adjusted aperture value so as to produce an appropriate exposure for substantially the remaining portion of the scene; and

(D) limiter means for preventing the shutter from being adjusted beyond a predetermined time.

4,174,162

AERIAL CAMERA MOUNTING MEANS

Joseph M. Giacomini, Columbia, Md., and David E. Lichy, Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 7, 1978, Ser. No. 922,628
Int. Cl.[2] B64D *47/08;* **G03B** *17/00, 29/00, 39/00*
U.S. Cl. 354—70 **9 Claims**

1. Apparatus for adjustably mounting an aerial photography camera externally of an aircraft, comprising:

(a) support means adapted for attachment externally of the aircraft;

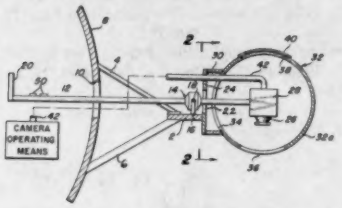
(b) a control rod;

(c) an aerial photography camera connected with one end of said control rod;

(d) a protective housing rigidly attached to said support means and enclosing said camera, said housing including a

first opening for receiving the control rod and a second opening in the bottom thereof;

(e) bearing means connecting said control rod intermediate its ends with said support means, said bearing means supporting said control rod for rotational movement about its longitudinal axis and for pivotal movement about at least one axis normal to its longitudinal axis; and



(f) handle means within the aircraft and connected with the other end of said control rod, whereby said control rod may be rotated and pivoted to a position in which the optical axis of said camera is vertical and passes through said second opening of said protective housing.

4,174,163

FILM UNIT PROCESSING MEANS

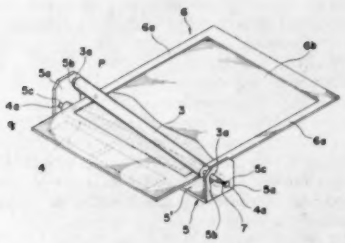
Nakao Oi, 8-32, Naka-machi 1-chome, Odawara-shi, Kanagawa-ken; Tadayoshi Shibata, Fuji Shashin Fuirumu Apato No. 10 A-218, 482-1, Nakanuma, Minami-ashigara-shi, Kanagawa-ken, and Toshio Goto, 1-41, Kishiki-cho, Omiya-shi, Saitama-ken, all of Japan

Continuation-in-part of Ser. No. 666,370, Mar. 12, 1976, abandoned, and a continuation-in-part of Ser. No. 621,332, Oct. 10, 1975, abandoned. This application Mar. 30, 1978, Ser. No. 891,680

Claims priority, application Japan, Oct. 12, 1974, 49/117588

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **11 Claims**



1. In a photographic apparatus including means for spreading a fluid in a film unit between a pair of sheet elements, spacers interposed between said sheet elements at opposite lateral edges, said spreading means comprising:

first and second pressure members with axes of the first and second pressure members being positioned in parallel to the surface of the film unit to be passed therebetween, at least one of said pressure members being inclined, at its center, to form a predetermined angle to the plane perpendicular to a direction of advance of the film unit and crossing over the other of said pressure members; and

means for supporting said first and second pressure members in said predetermined relation to each other,

whereby, as the film unit moves between the pressure members, the processing solution is initially spread in a greater amount at the portions adjacent said spacers at said lateral edges of said sheet elements than at the center portion thereof and after the film unit moves out from between said first and second pressure members, said processing solution flows towards the center portion of the unit as said pair of sheet elements move away from each other at the center to cause said processing solution to spread evenly between the sheets.

4,174,164

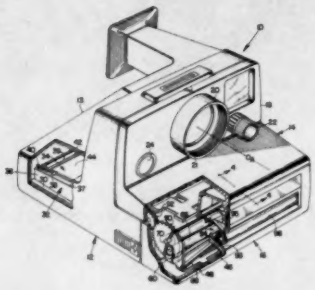
PHOTOGRAPHIC PROCESSING APPARATUS

Harvey S. Friedman, Sudbury, and Irving S. Lippert, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 30, 1978, Ser. No. 910,736

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **8 Claims**



1. Photographic processing apparatus for use with self-processable film units of the type which include a pair of resiliently flexible, substantially flat, rectangular, superposed sheet elements and a rupturable container of processing fluid positioned adjacent a leading edge of the film unit and adapted to have its fluid contents spread between the sheet elements in a substantially uniform thin layer which covers an exposure area of given length and width, said apparatus comprising:

a pair of elongated cylindrical processing rollers rollers of given width;

means for mounting said processing rollers in juxtaposed relationship to define an elongated pressure generating gap through which a film unit may be advanced to apply a pressure to the film unit to first rupture the container of processing fluid causing its fluid contents to be released as a generally elongated mass extending widthwise of the film unit's exposure area and adjacent the leading edge of the film unit and then to cause the released mass of processing fluid to flow between the sheet elements opposite to the direction of advancement of the film unit through said gap so that the widthwise distributed mass of processing fluid is progressively deposited in a layer lengthwise of the film unit's exposure area, said mounting means being structured so that said processing rollers are mounted with their axes of rotation lying in parallel spaced apart planes and intersect one another when either roller axis is projected onto the other roller's mounting plane so that said rollers present to a film unit an effective gap, different from the geometric gap separating said rollers, which varies across the width of said rollers, said effective gap operating, as the fluid mass is spread lengthwise over the exposure area, to reduce the thickness of the fluid widthwise of the film unit's exposure area in such a way that the widthwise thickness of the fluid over centeral regions of the exposure area is reduced relative to the fluid layer's thickness over lateral regions of the exposure area compared to what such central region's fluid thickness would otherwise be if said roller's axes did not intersect said rollers further operating to induce a widthwise twist in a film unit after it emerges from said gap so that one side of the film unit is displaced away from the attitude that it would normally assume if said roller's axes did not inter-

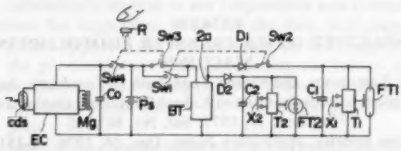
sect and the other side of the film unit is displaced away from the attitude it would normally assume, and opposite to the displacement of that of said one side, if said roller's axes did not intersect; and

interceptor means positioned along the path of travel a film unit takes after it emerges from said gap and structured for engaging said one side of said film unit as the film unit is advanced lengthwise past said intereceptor means to bend said one side in a direction opposite to the direction in which it is twisted by said rollers, said interceptor means operating to reduce the thickness of the fluid layer widthwise over regions of the exposure area of the film unit corresponding to said one side engaged by said interceptor means compared to what the fluid layer thickness in such regions would be absent said interceptor means, said rollers in combination with said interceptor means cooperating in the foregoing manner to provide a layer of fluid whose thickness, both widthwise and lengthwise of the film unit's exposure area, is substantially constant.

4,174,165
POWER SUPPLY CONTROL DEVICE FOR CAMERAS

Takeo Hohda; Shinji Tominaga, both of Sakai, and Yoshiharu Ohta, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1978, Ser. No. 897,841
Claims priority, application Japan, Apr. 29, 1977, 52-50513
Int. Cl.[2] G03B *17/24, 15/05*
U.S. Cl. 354—105 **10 Claims**



1. In a photographic system which includes means for effecting an exposure operation of a camera, means for initiating the exposure operation, a first electronic flash means for illuminating a scene to be photographed and means for recording auxiliary data on a film, the recording means having a second electronic flash means for illuminating the data to be recorded, a power supply control device comprising:

a first capacitor for energizing said first electronic flash means;

a second capacitor for energizing said second electronic flash means;

a voltage converter means for generating a voltage at an output terminal, said first and second capacitors being connected to said output terminal;

a first switch means manually operable independently of the camera exposure initiating means for permitting said first capacitor to be charged with the output voltage of said voltage converter; and

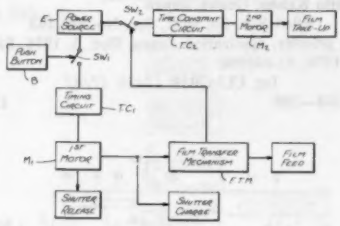
a second switch means operable by said initiating means for permitting said second capacitor to be charged with the output voltage of said voltage converter.

4,174,166
MOTOR DRIVE DEVICE FOR LONG-FOOTAGE FILM

Kouichi Daitoku, Tokyo, Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kosaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 762,452, Jan. 28, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,792
Claims priority, application Japan, Jan. 30, 1976, 51-8661[U]
Int. Cl.[2] G03B *1/18*
U.S. Cl. 354—173 **3 Claims**

1. In a motor drive device for long-footage film comprising a first motor for effecting shutter release as well as shutter charge and for driving a film supply spool in order to feed a predetermined length of the film, a second motor for rotating a take-up spool in order to take up the film fed by the first motor, and a time constant circuit for controlling the time interval during which the second motor is powered so that the power supply to the second motor may be cut off before the first motor feeds said predetermined length of the film, the improvement comprising control means for controlling the first motor so that shutter release by the first motor may be

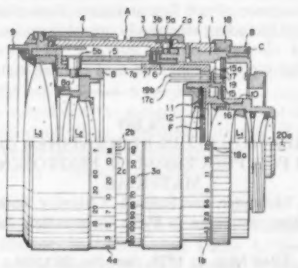


effected after the lapse of a predetermined time interval from the stoppage of the power supply to the second motor, which predetermined time interval is the longest time interval of the time intervals from the cut-off of the power supply to the second motor to the actual stoppage thereof when photographs are taken from the first exposure to an exposure in which the tension caused by the take-up spool becomes equal to the resistant force to the tension at the film supply spool side on the film.

4,174,167
INTERCHANGEABLE LENS FOR CAMERAS

Motoi Nagashima, Tokyo, Japan, assignor to Cima Kogaku Company Limited, Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 814,125
Claims priority, application Japan, Jul. 9, 1976, 51-81527
Int. Cl.[2] G03B *9/07, 17/00*
U.S. Cl. 354—196 **4 Claims**



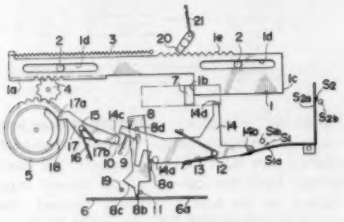
1. An interchangeable lens for cameras comprising a lens barrel assembly including therein a lens system and a diaphragm blade means arranged in said lens system and a diaphragm operating lever connected to said diaphragm blade means, a separate mount assembly interchangeably secured to said lens barrel assembly to be fitted to all types of cameras and including therein an operating means engageable with said diaphragm operating lever to operate said diaphragm operating lever, wherein said operating means comprises a diaphragm operating ring rotatable concentrically with the optical axis and biasing in one direction, and a sliding plate supported movably concentrically with the optical axis on said diaphragm operating ring and biased in the direction reverse to that of said diaphragm operating ring and engaged with said diaphragm operating lever, and a diaphragm controlling cam

ring rotatably held concentrically with the optical axis between said lens barrel assembly and mount assembly and engageable with said diaphragm operating lever, said interchangeable lens being adapted for a plurality of different types of cameras by selection of different types of mount assemblies having different operating means.

4,174,168
SAFETY MECHANISM FOR CAMERAS

Maki Yamashita, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1977, Ser. No. 856,143
Claims priority, application Japan, Dec. 3, 1976, 51-145920; Dec. 10, 1976, 51-148900
Int. Cl.[2] G03B *17/38, 17/42*
U.S. Cl. 354—206 **13 Claims**



1. A camera employing a film cartridge carrying film having longitudinally spaced frame indexing perforations, comprising:

a shutter actuating electromagnet;

means for sensing a film frame indexing perforation of the film from the film cartridge loaded in the camera and assuming a first condition when said perforation is in a predetermined position and assuming a second condition in the presence of the film cartridge in the camera with said indexing perforation spaced from said predetermined position in the direction opposite to the film advancing direction; and

circuit means for energizing said electromagnet, transferable to alternative enabled and disabled states in response to the occurrence of said first and second conditions respectively and including selectively operable means for actuating said circuit means to energize said electromagnet when said circuit means is in said enabled state.

4,174,169
ANTI-OXIDATION FLUID REPLENISHER CONTROL SYSTEM FOR PROCESSOR OF PHOTOSENSITIVE MATERIAL

Theodore A. Melander, and Ralph L. Charnley, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

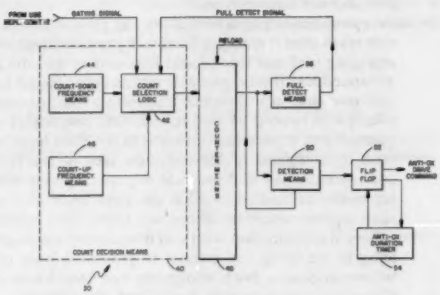
Filed Mar. 2, 1978, Ser. No. 882,804
Int. Cl.[2] G03D *3/06*
U.S. Cl. 354—324 **26 Claims**

1. A control system for controlling anti-oxidation replenisher means to provide anti-oxidation fluid to a processor of photosensitive material, the control system comprising:

count decision means responsive to whether use-related chemical replenishment is occurring within the processor for providing a first signal when use-related chemical replenishment is not occurring and a second signal when use-related chemical replenishment is occurring;

counter means operatively coupled to the count decision means for holding a first predetermined value and for counting in one direction in value whenever the count decision means provides the first signal and for counting in the opposite direction in value whenever the count decision means provides the second signal; and

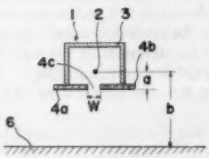
detection means operatively coupled to the counter means for detecting the occurrence of a second predetermined value in the counter means and for causing the anti-oxidation replenisher means to initiate anti-oxidation fluid replenishment.



4,174,170
CONDUCTIVE TONER TRANSFER PHOTOCOPYING MACHINE

Toshio Yamamoto, and Shizuo Yuge, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1977, Ser. No. 861,005
Claims priority, application Japan, Dec. 16, 1976, 51-151677
Int. Cl.[2] H01T *19/04;* G03G *15/00*
U.S. Cl. 355—3 TR **8 Claims**

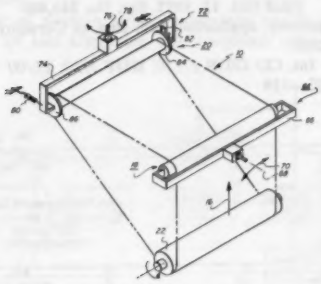


1. In a photocopying apparatus wherein a latent image of an original document to be copied is formed on an electrophotosensitive medium, electrically conductive toner particles are applied to said medium to develop said image, and said developed image is transferred onto copy paper by bringing said copy paper into effective contact with said electrophotosensitive medium and applying an ionic current from a corona discharge unit to the rear surface of said copy paper to cause said toner particles to move onto said copy paper, the improvement comprising shield elements which are provided between said electrophotosensitive medium and said discharge unit, and defining a slit for passing the corona discharge and having a width and said corona discharge unit being spaced from said electrophotosensitive medium and the speed of movement of the copy paper past the corona charger and the voltage applied to the corona charger being such that the amount of said current applied to said copy paper is sufficient to cause transfer of toner particles onto said copy paper but insufficient to permit storage in said copy paper of a charge great enough to cancel the charge of said toner particles transferred onto said copy paper.

4,174,171
BELT TRACKING SYSTEM

Ralph A. Hamaker, Penfield, and Kenneth J. Buck, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 24, 1978, Ser. No. 927,191
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 BE 12 Claims



1. An apparatus for controlling the lateral alignment of a belt arranged to move in a pre-determined path, including:

a steering post arranged to provide support for the belt and being mounted for pivotable movement about an axis substantially normal to the longitudinal axis thereof;

means for supporting resiliently the belt, said supporting means opposing the movement of the belt laterally from the pre-determined path and causing the belt to apply a moment on said steering post pivoting said steering post in the direction to restore the belt to the pre-determined path;

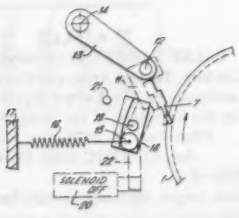
means for moving the belt in the pre-determined path; and

means for supplying a pressurized fluid between at least a portion of said steering post and the belt to form a fluid film supporting the belt and reducing friction between the belt and said steering post.

4,174,172
CLEANING METHODS AND APPARATUS FOR A PHOTOCOPYING DEVICE

John N. Lane, Leighton Buzzard, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1977, Ser. No. 845,696
Claims priority, application United Kingdom, Dec. 17, 1976, 52774/76
Int. Cl.[2] G03G *21/00*; B08B *7/00*
U.S. Cl. 355—15 13 Claims

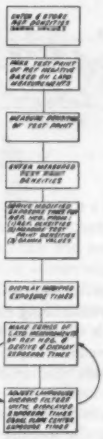


6. Apparatus for cleaning a surface including a cleaning blade engagable with said surface, drive means for moving the surface past the cleaning blade with rest periods of no relative motion, and blade translation means for moving the blade out of contact with the surface at a first position during a said period of no relative motion and for returning the blade into engagement with the surface at a second position downstream of said first position.

4,174,173
PHOTOGRAPHIC PRINTER WITH INTERACTIVE COLOR BALANCING

John Pone, Jr., Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Nov. 4, 1977, Ser. No. 848,738
Int. Cl.[2] G03B *27/78*
U.S. Cl. 355—38 8 Claims



3. In a photographic printer, the improvement comprising:

density measuring means for measuring densities of a reference film;

printing means for printing a test print from the reference film based upon measured densities of the reference film and initial exposures;

data entry means for receiving, from a user of the photographic printer, desired print density values for the test print and measured print density values for the test print; and

exposure control means for deriving modified exposures from the desired print density values, the measured print density values, and the measured densities of the reference film, and controlling subsequent printing of the printing means based upon the modified exposures.

4,174,174
COMPOSING REDUCING CAMERA

Robert K. Hunter, Jr., Northridge; David A. Grafton, Santa Monica; Joseph Lander, Covina; Lauren V. Merritt, Sierra Madre; Donald E. Stewart, Arcadia, and Donald H. Wolpert, Los Angeles, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1977, Ser. No. 777,866
Int. Cl.[2] G03B *27/46, 27/32*
U.S. Cl. 355—39 4 Claims

1. A system for automatically producing microfilm or microfiche in a variety of formats and reduction ratios from roll microfilm input comprising:

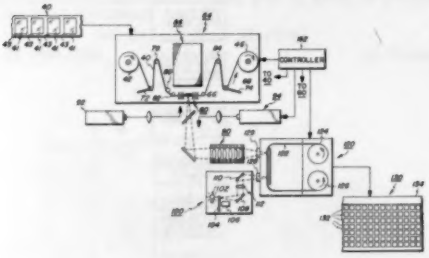
a microfilm transport means for accepting rolls of input microfilm, transporting said microfilm to a filming gate, stopping and registering individual microfilm frames in said filming gate,

a film exposure means for illuminating individual frames in the filming gate as the microfilm is automatically stepped frame by frame through the filming gate,

a reducing lens means for imaging the input microfilm

frames with high optical resolution at various reduction ratios to a focal plane,

a microfilm recording means for accepting the reduced images from said reducing lens means at said focal plane within the recorder; said microfilm recording means being automatically controlled in synchronism with the microfilm transport means to position the output microfilm or microfiche in two dimensions in said focal plane of the recording device resulting in a plurality of reduced microimages being arranged in columns and rows corresponding to a preselected format,



first sequencer means for controlling the microfilm transport means when a search is being executed whereby a selected and coded frame is registered in the film gate,

second sequencer means for providing system operational and level commands, said second sequencer means comprising a microprocessor, and

third sequencer means for controlling said microfilm transport means during the loading and unloading of said microfilm.

4,174,175

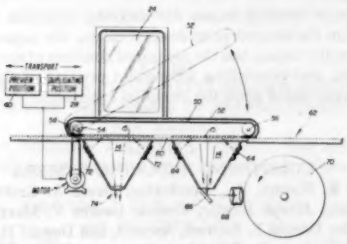
COPY PREVIEW APPARATUS

James D. DiMaria, 11879 St. Trinians Ct., Reston, Va. 22314

Continuation-in-part of Ser. No. 790,024, Apr. 22, 1977, abandoned. This application Feb. 1, 1978, Ser. No. 874,251

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—44 **5 Claims**



1. Apparatus for previewing and copying documents in a positive form comprising:

means for projecting the image of a document on a viewing surface at a previewing station to display an image of the document for viewing prior to copying;

means for transporting the viewed document from said previewing station to a copying station, the transporting means including a transparent endless belt having a surface in contact with a surface of the document, and means for moving the belt with the document in contact therewith between the previewing station and the copying station; and

means for copying the document at said copying station in the same form that the document was viewed at the previewing station.

4,174,176

DEVICE FOR DETACHABLE ATTACHMENT OF A PRINT ORIGINAL TO A CYLINDER

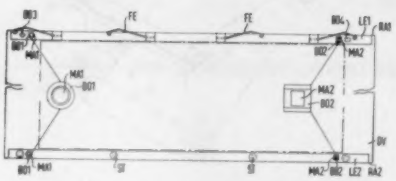
Josef Windele, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,800

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 7712225

Int. Cl.[2] **G03B** *27/10;* **B41F** *1/28, 21/00*

U.S. Cl. 355—110 **6 Claims**



1. A device for removably attaching a negative to a cylinder comprising:

means for attaching spring clips along one longitudinal edge of the negative,

means for attaching locking knobs along the other longitudinal edge of the negative,

said locking knobs being generally aligned with corresponding ones of said spring clips, and

said spring clips being engagable over said locking pins when said negative is rolled in the form of a cylinder, said means for attaching said spring clips being a spring contact strip, said spring contact strip being an elongated strip of material having a plurality of spring clips secured at spaced intervals along the length thereof, said means for attaching said locking knobs being a knob contact strip in the form of an elongated strip of material with a plurality of knobs secured at like spaced intervals along the length thereof, the negative having a first pair of marks located in the vicinity of a first longitudinal end of the negative and adjacent to the longitudinal edges thereof, said negative having a second pair of marks located at the opposite longitudinal end in the vicinity of the longitudinal edges, each of the contact strips having openings which conform in configuration to said respective marks but which are larger in size, said contact strips being caused to overlie the region of said marks such that said holes align with the correspondingly configured marks on the negative, whereby said contact strips are properly positioned on the negative.

4,174,177

FALSE TARGET WARNING SYSTEM

Keith L. Gardner, Tucson, Ariz., and Goro Fujiwara, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1978, Ser. No. 933,300

Int. Cl.[2] **G01C** *3/08;* **F41G** *7/00*

U.S. Cl. 356—5 **8 Claims**

1. A false target warning system for a target designator, comprising:

detector means for detecting electromagnetic energy from the target designator that is reflected back thereto and which defines a path of optical transmission;

an amplifier connected to the output of said detector means;

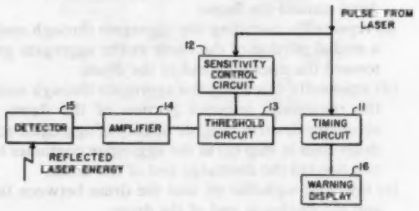
a threshold circuit having first and second inputs, said first input connected to the output of said amplifier, said threshold circuit configured to have a signal output when-

ever the signal applied to said first input exceeds the threshold level;

a sensitivity control circuit for controlling the threshold level of said threshold circuit, comprising: an integrator having the output thereof connected to said second input of said threshold circuit;

a one-shot multivibrator connected to the negative input of said integrator, said one-shot multivibrator configured to be triggered by a pulse of energy from the target detector;

a source of positive voltage connected to the positive input of said integrator, the integrator output being



equal to said positive voltage minus the integrated signal from said one-shot multivibrator, thereby supplying a voltage that decreases with time to said second threshold input to cause the threshold level of said threshold circuit to decrease with time;

a timing circuit triggered by pulses of energy from the target designator, connected to the output of said threshold circuit and configured to be triggered simultaneously with said one-shot multivibrator; and

indicator means, connected to said timing means, for warning the operator of the target designator whenever said timing circuit receives a signal from said threshold circuit in a time less than a predetermined interval.

4,174,178

BLOOD SERUM BEARING FILM WITH POSITION INDICATING MARK

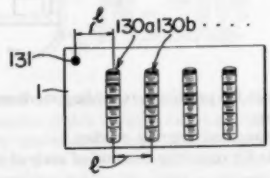
Teruo Ouchi, Hachioji, and Yutaka Kato, Tama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 572,729, Apr. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,163

Claims priority, application Japan, May 7, 1974, 49/50423; Jun. 8, 1974, 49/66532[U]; Sep. 4, 1974, 49/100954

Int. Cl.[2] G01N *33/16, 21/16*

U.S. Cl. 356—39 **18 Claims**



1. A blood serum-bearing film comprising:

a serum-bearing film having a leading and a trailing edge;

a plurality of equally spaced blood serum samples disposed on said film in an array, each said blood serum sample having a leading and a trailing edge; and

a positive indicating mark disposed forward of the leading edge of the sample closest to said leading edge of said film by a distance representative of the spacing between adjacent ones of said samples.

4,174,179

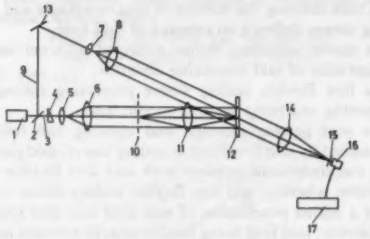
CONTINUOUS FEED HOLOGRAPHIC CORRELATOR FOR RANDOMLY ORIENTED WORKPIECES

Theodor Tschudi, Reinmattstrasse 1, and Guy Indebetouw, Madergutstrasse 31, both of Bern, Switzerland

Filed Aug. 24, 1977, Ser. No. 827,351

Int. Cl.[2] G06K *9/08*; G03H *1/28*; G02B *27/38*

U.S. Cl. 356—71 **13 Claims**



1. A method comparing an object with a reference specimen by means of a coherent optical multichannel correlator employing a coherent input light beam and an output beam passing through a filter, said method comprising the steps of:

(a) producing a holographic filter containing a spatially distinct plurality of images each representing characteristic properties of the referenece specimen in different specimen orientations;

(b) using said holographic filter as the filter in the correlator;

(c) translationally moving the object to be compared through the coherent input light beam of the correlator;

(d) detecting and measuring the intensity of the output beam of the correlator through a slit diaphragm; and

(e) sorting the object in dependence upon the maximum value of the intensity measured during said translational movement of the object to be compared.

4,174,180

ULTRAMICROSCOPIC SPECTROMETER

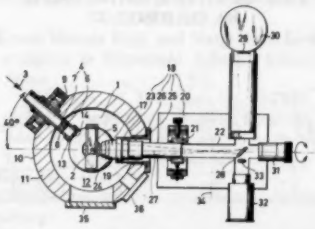
Josef Gebhart, Dietzenbach; Gerhard Heigwer, Offenbach am Main; Joachim Heyder; Friedel Haas, both of Frankfurt am Main, and Christa Roth, Eschborn, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen, Neuherberg, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,936

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637333

Int. Cl.[2] G01N *21/00*

U.S. Cl. 356—338 **1 Claim**



1. In an ultramicroscopic spectrometer for examining properties of aerosol particles, including a receptacle having a wall defining a measuring chamber; an aerosol jet generating means for forming an aerosol jet from the particles by aerodynamic focusing; a mount supporting the aerosol generating means in the measuring chamber; a first passage means supported in the receptacle wall for passing an incident illuminating beam

through the receptacle wall into the measuring chamber; an astigmatic image forming system supported in said first passage means for focusing the illuminating beam in the measuring field; a second passage means supported in the receptacle wall for passing an information beam of the aerosol jet through the receptacle wall from the measuring chamber; the axes of the illuminating beam, the information beam and the aerosol jet intersecting in a measuring field in the measuring chamber; the improvement comprising

(a) a base defining the bottom of said receptacle and including means defining an opening in said base;

(b) a mount adjusting device arranged adjacent said base externally of said measuring chamber;

(c) a first flexible sealing sleeve projecting through said opening and being secured to said base;

(d) a post passing through said opening and being surrounded by said first flexible sealing sleeve; said post being in circumferential contact with said first flexible sealing sleeve, whereby said first flexible sealing sleeve provides for a sealed penetration of said post into said measuring chamber; said post being further attached to said mount in said measuring chamber and to said mount adjusting device externally of said measuring chamber, whereby said mount can be adjusted by said mount adjusting device during examination of the aerosol particles in said measuring chamber;

(e) a second flexible sealing sleeve projecting through an aperture in said receptacle wall and being secured thereto;

(f) a tube passing through said aperture in said receptacle wall and projecting into said measuring chamber for directing said information beam thereinto; said tube being surrounded by said second flexible sealing sleeve and being in circumferential contact therewith, whereby said second flexible sealing sleeve provides for a sealed penetration of said tube into said measuring chamber; said tube being included in said second passage means and having a microscope objective extending into said measuring chamber; and

(g) a tube adjusting device arranged externally of said measuring chamber and being operatively connected to said tube for adjusting said tube and said microscope objective by said tube adjusting device during examination of the aerosol particles in said measuring chamber.

4,174,181

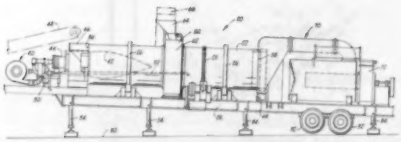
METHOD AND APPARATUS FOR ESTABLISHING AGGREGATE CASCADE ZONES IN AN APPARATUS FOR PRODUCING HOT MIX ASPHALT

David L. Garbelman, Edmond; William H. Minor, Bethany, and Arthur G. Shaw, Mustang, all of Okla., assignors to CMI Corporation, Oklahomo City, Okla.

Filed Apr. 17, 1978, Ser. No. 896,512

Int. Cl.[2] B28C *5/20*

U.S. Cl. 366—2 **21 Claims**



1. In a method of heating and drying aggregate using a rotating drum having the input end thereof higher than the output end thereof, comprising the steps of:

(a) producing a flame in the drum extending from the input end thereof toward the discharge end thereof;

(b) introducing the aggregate radially into the input end of the drum around the flame;

(c) repeatedly cascading the aggregate through and around a medial portion of the flame as the aggregate gravitates toward the discharge end of the drum; and then

(d) repeatedly cascading the aggregate through and around the remaining, terminal portion of the flame entirely across the drum in a higher density of aggregate across the drum than in step (c) as the aggregate continues to gravitate toward the discharge end of the drum.

2. In a method of making hot mix asphalt using a rotating drum having the input end thereof higher than the output end thereof, comprising the steps of:

(a) producing a flame in the drum extending from the input end thereof to a medial portion of the length of the drum;

(b) introducing aggregate radially into the input end of the drum around the flame;

(c) repeatedly cascading the aggregate through and around a medial portion of the flame as the aggregate gravitates toward the discharge end of the drum;

(d) repeatedly cascading the aggregate through and around the remaining, terminal portion of the flame entirely across the drum in a higher density of aggregate across the drum than in step (c) as the aggregate continues to gravitate toward the discharge end of the drum;

(e) injecting asphaltic oil into the drum between the flame and the discharge end of the drum;

(f) mixing the aggregate and asphaltic oil in the remaining portion of the drum as the aggregate continues to gravitate toward the discharge end of the drum to form the hot mix asphalt; and

(g) discharging the hot mix asphalt from the discharge end of the drum.

4,174,182

NEEDLE PRINTING HEAD

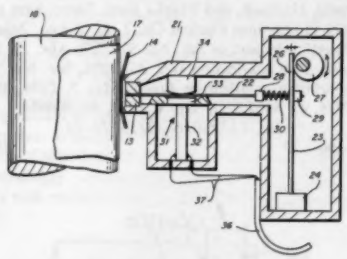
Josef Lendl, Ottensoos, Fed. Rep. of Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,607

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2715617

Int. Cl.[2] B41J *3/12;* **H02K** *49/00*

U.S. Cl. 400—124 **7 Claims**



5. A mechanism for printing a recording medium, the mechanism comprising:

an array of elongated printing needles,

a needle guide for receiving one end of each of said printing needles,

a reciprocating means for driving each of said printing needles, said printing needles extending in a substantially straight line from the needle guide to the reciprocating means,

an oscillator for driving each of said reciprocating means,

a yieldable coupling for transmitting motion from said reciprocating means to said printing needles, and

a brake for clamping directly upon each of said printing needles, wherein said brake, when energized, prevents the yieldable coupling from transmitting motion from said reciprocating means to said printing needles.

4,174,183

SUPPORT FRAME

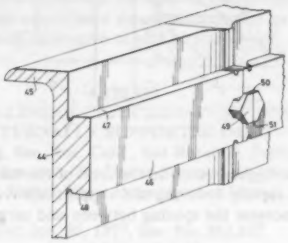
Derek Ferns, Trelleck, Wales, assignor to Self-Level Covers Aktiengesellschaft, Basel, Switzerland

Filed Mar. 1, 1978, Ser. No. 882,386

Claims priority, application United Kingdom, Mar. 1, 1977, 8564/77; Nov. 29, 1977, 49508/77

Int. Cl.[2] E02D *29/14*

U.S. Cl. 404—26 **7 Claims**



3. A frame for supporting a member at the level of a paved surface, the frame being constituted by a wall portion surrounding an aperture whose cross-section matches that of the member to be supported, an outwardly extending flange projecting from one edge of the wall portion, and internally extending support means adapted to support said member with its top surface substantially level with said one edge of the wall portion when said one edge is uppermost and with the opposite edge of the wall portion to said one edge when said opposite edge is uppermost.

4,174,184

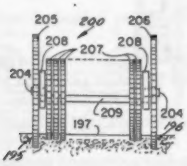
SNOWPLOWABLE PAVEMENT MARKER AND METHOD AND APPARATUS FOR INSTALLING SAME

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Division of Ser. No. 789,249, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,858, Apr. 30, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 935,069

Int. Cl.[2] E01F *9/04*

U.S. Cl. 404—72 **15 Claims**



1. A method of installing on a finished roadway surface a pavement marker which includes two longitudinally extending and laterally spaced-apart keel members extending below a plane and a support member interconnecting said keel members and extending below the plane, said method comprising the steps of positioning a cutting apparatus on the pavement in an operating position, cutting in the pavement with said cutting apparatus three arcuate recesses including two laterally spaced-apart keel recesses and a support member recess disposed therebetween all without moving said cutting apparatus from said operating position, said recesses being disposed and dimensioned for respectively receiving said keel members and said support member therein to a depth such that the roadway surface lies substantially in the plane, placing in each of said recesses adhesive material which adheres to both the pavement material and the material of the keel members and support member, and inserting said keel members and said support member respectively in said recesses and said adhesive material so that the roadway surface lies substantially in the plane for fixedly securing the pavement marker to the pavement.

4,174,185

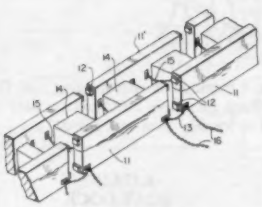
FLOATING-TYPE ANTI-OIL ANTI-IMPACT AND ANTI-WAVE BARRIER

Naoji Toki, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 14, 1977, Ser. No. 851,585

Int. Cl.[2] E02B *3/06, 3/22, 15/04*

U.S. Cl. 405—27 **7 Claims**



1. A floating anti-oil, anti-impact and anti-wave barrier comprising:

a plurality of hollow, elongated floating members each having longitudinally extending sides and opposite ends;

said floating members being aligned and connected in at least two separate rows in end-to-end fashion with regular intervals between adjacent ends of adjacent floating members, to thereby form at least two separate elongated floats, each said interval between adjacent floating members being substantially less than the dimension of said sides of each said floating member, taken in the longitudinal direction of each said float;

said floats being arranged and connected in laterally spaced relation to each other with spaces between adjacent said floats, said adjacent floats being longitudinally staggered with respect to each other, such that said longitudinal sides of said floating members of each said float laterally face and longitudinally overlap said intervals of adjacent floats; and

a plurality of flexible floating spacers positioned in said spaces between laterally adjacent said floats, each said spacer being in contact with respective of said longitudinal sides of respective said floating members of said adjacent floats.

4,174,186

FLOATING-TYPE ANTI-OIL ANTI-IMPACT ANTI-WAVE BARRIER

Hironao Kasai; Hitoshi Fujii, and Naoji Toki, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,523

Claims priority, application Japan, May 27, 1977, 52-67679[U]; May 30, 1977, 52-68600[U]

Int. Cl.[2] E02B *15/04*

U.S. Cl. 405—71 **6 Claims**

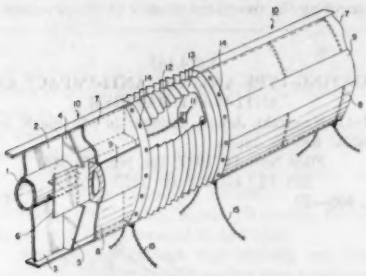
6. A floating-type, anti-oil, anti-impact, anti-wave barrier unit comprising:

a plurality of longitudinally extending float units adapted to float on a body of water, said float units being arranged to extend parallel to each other and laterally spaced from each other with lateral spaces therebetween, each said float unit comprising a hollow, rectangular, elongated box-shaped float;

means for flexibly connecting adjacent laterally spaced said float units; and

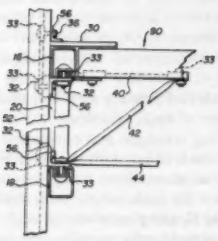
buffer member means loosely positioned in the said lateral

space between adjacent laterally spaced said floats, said buffer member means comprising a rectangular floating



member, a framework surrounding said floating member, and resilient members mounted on said framework and adapted to loosely abut said floats.

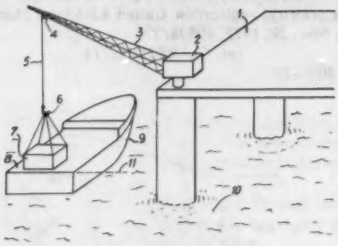
4,174,187
BOAT DOCK
Rudolph E. Parisien, 891 Rainbow St., Ottawa, Ontario, Canada
Filed Apr. 13, 1978, Ser. No. 896,041
Claims priority, application Canada, Apr. 18, 1977, 276369
Int. Cl.[2] E02B *3/20*
U.S. Cl. 405—221 **7 Claims**



1. A boat dock comprising a pair of spaced apart trusses adapted to support decking, each said truss comprising upper and lower channel members spaced apart by braces angularly disposed with respect to said channel members, a cross member at each end of said dock for joining ends of said upper channel members at each end of said dock, at least one diagonal member extending diagonally between said trusses, upright members adjacent each corner for supporting said dock, said upright members being in the form of channel members each having a restricted longitudinal opening in one side and a right angle bracket secured to each said lower channel member adjacent each end of said lower channel member so that a bolt extending through each said bracket extends into the restricted opening in said upright member and is adapted to adjustably secure said upright member to said lower channel member.

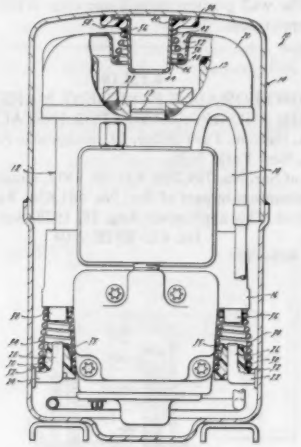
4,174,188
PROCESS AND APPARATUS FOR TRANSFER OF CARGO AT SEA
Andre G. Brun, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France
Filed Jun. 2, 1977, Ser. No. 802,855
Claims priority, application France, Jun. 2, 1976, 7616591
Int. Cl.[2] B66D *1/50*
U.S. Cl. 414—139 **7 Claims**

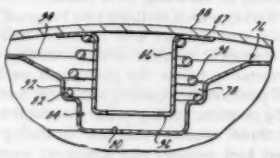
1. A process of transferring cargo from a ship at sea which is rising and falling by hoisting means mounted on a relatively stable platform comprising placing the cargo on a vertically moveable support, located on said ship raising said support relative to said ship, lifting the cargo from said support by means of a cable controlled by said hoist means when said ship



reaches its highest point on the crest of the wave and immediately and rapidly lowering said support relative to said ship to quickly increase the spacing between said cargo and said support.

4,174,189
REFRIGERATION COMPRESSOR SUSPENSION SYSTEM
John P. Elson, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio
Filed Feb. 10, 1977, Ser. No. 767,385
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—363 **15 Claims**





1. A suspension system for a hermetic refrigeration compressor comprising:
a hermetically sealed shell;
compressor means;
motor means rotationally driving said compressor means;

means resiliently mounting said compressor means within said shell including at least one spring;

a shroud having a closed top covering one end of said motor means and having a cylindrical shoulder disposed coaxially with the rotational axis of said motor; and

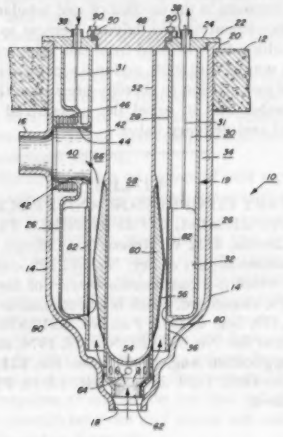
stop means secured to said shell, said stop means including a rigid projection extending at least partially through said spring and being directly engageable with and cooperating with said cylindrical shoulder to limit relative movement of said compressor means with respect to said shell in a direction transverse to said rotational axis.

4,174,190

ANNULAR LINEAR INDUCTION PUMP WITH AN EXTERNALLY SUPPORTED DUCT

Edwin R. Craig, San Jose, Calif., and Robert S. Semken, Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 30, 1977, Ser. No. 811,627
Int. Cl.[2] H02N *4/20*
U.S. Cl. 417—50 **15 Claims**



1. An annular linear induction pump for pumping liquid metal, comprising:

(a) a housing having a first opening defining a first open end with the opposite end being open and having toward said first open end a second opening;

(b) a stator assembly comprising a stator held in a fluid tight annular container with a fluid coolant inlet and a fluid coolant outlet enabling contacting said stator with a fluid coolant to cool said stator, said stator assembly having a thin duct wall covering the stator from contact with the liquid metal and being removably held in said housing and filling a portion of said first open end of said housing, and during operation said stator being capable of developing a magnetic flux and a series of electrical poles therein, said container including an outer wall and an inner wall, said inner wall including said thin duct wall, and said stator being held within said container integral therewith for removal with said assembly from said housing; and

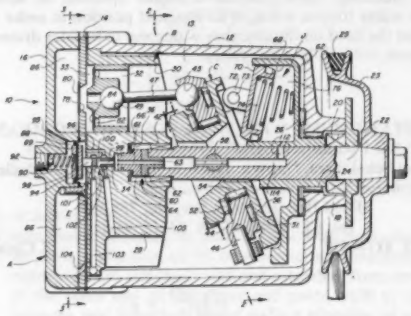
(c) means for receiving magnetic flux created during operation of said stator removably positioned in the housing inside said annular container to comple'e filling said first open end of said housing and leaving a liquid metal flow annulus between said annular container and said means for receiving a magnetic flux, which annulus connects said openings in said housing for one pass flow of fluid through said housing, with said means for receiving a magnetic flux being capable of having induced therein magnetic paths corresponding to said poles of said stator.

4,174,191

VARIABLE CAPACITY COMPRESSOR

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 18, 1978, Ser. No. 870,395
Int. Cl.[2] F04B *1/12*
U.S. Cl. 417—222 **3 Claims**



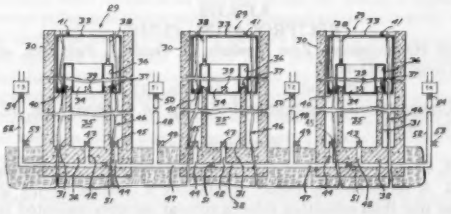
1. A compressor comprising: means defining a plurality of gas working spaces each having a piston cooperating with suction and discharge ports to compress a fluid therein; a drive shaft; a cam mechanism driven by said drive shaft; a swash plate driven by said cam mechanism in a nutating path about the drive shaft axis; means operably connected between said swash plate and the individual pistons to impart reciprocating drive to said pistons; means for pivoting said swash plate and said cam mechanism at a fixed point along the drive shaft axis such that the stroke length of the pistons may be varied; means for constraining rotational movement of said swash plate, said means including an arcuately shaped arm pivoted at one end in a fixed support, a pin extending from the opposite end of said arm and engaging said swash plate, the axis of said pin and the pivot axis of said one end of said arm being perpendicular; a fluid operated actuator operatively connected to said swash plate to vary the position thereof, said actuator having a fluid chamber cooperating with a moveable piston, and means for controlling the pressure in said chamber in response to suction pressure.

4,174,192

TIDE OPERATED PUMPS

Francis E. Daddario, 15 Fowler La., Falmouth, Mass. 02450

Filed Dec. 19, 1977, Ser. No. 861,685
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—333 **17 Claims**



1. A tide operated hydroelectric system including a series of pumps, each pump including at least one piston member and a cylinder member defining therewith a vertically expansible

chamber, one member fixed on the ocean bottom and the other including a float, operating means including conduits in communication with said chambers and control valves for said conduits, said conduits and valves arranged to provide a water inlet at low tide for each pump with the chambers filling as the tide lifts the floats, the entrapment of water in each chamber and its subsequent discharge therefrom under a wanted head, said operating means including at least one turbine operable by the discharge from one pump chamber, said operating means also including means operable to enable water discharged from another pump to be under a head adequate to operate said one pump independently of the tide level, and at least some of said floats including valve controlled means operable to admit ballast water therein when in an elevated position in order to increase the head on the chamber water and to be later drained to restore normal float buoyancy.

4,174,193

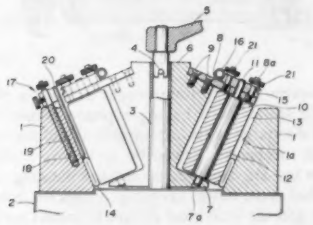
PERISTATIC PUMP WITH HOSE POSITIONING MEANS AND PRESSURE ADJUSTMENT APPARATUS

Kinsaku Sakakibara, Nagoya, Japan, assignor to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,304

Int. Cl.[2] F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—477 **5 Claims**



1. A liquid transfer pump in which a soft flexible hose is arranged along an internal peripheral wall of a semi-circular external enclosure, a drive shaft which is driven by drive means is provided at a position with an equal distance from said internal peripheral wall and a plurality of squeeze rollers, which travel around said drive shaft as a center while rolling around their own axis in accordance with rotation of said drive shaft and squeeze said hose while depressing the hose against said internal peripheral wall to transfer a liquid contained in said hose from one position to another position, are rotatably supported by a holder fixed on said drive shaft, wherein said internal peripheral wall of the external enclosure is slanted and external peripheral surfaces of said squeeze rollers are arranged in parallel with said internal peripheral wall, two core bars being fixed at eccentric positions of both ends of a core of said squeeze roller, a worm wheel to which one of said core bars is fixed, a hole in the holder receiving the other of said core bars and a worm engaged with said worm wheel.

4,174,194

RECIPROCATING PUMP

Paul Hammelmann, Zum Sundern 17, Oelde 1, Fed. Rep. of Germany (D-4740)

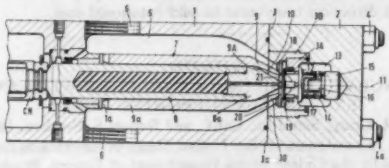
Filed Jul. 1, 1977, Ser. No. 812,368

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631217

Int. Cl.[2] F04B *21/02*

U.S. Cl. 417—567 **12 Claims**

1. A reciprocating pump, comprising a housing having at least one fluid-admitting inlet; a tubular member mounted in said housing and including a hollow conical end portion; a plunger reciprocable in said tubular member; a lightweight suction valve having a mobile valving element installed in said housing intermediate said inlet and said conical end portion to normally seal said inlet from the interior of said tubular member, said valving element having an opening for the flow of fluid from said tubular member and being movable to an open position in which said valve defines a path for the flow of fluid from said inlet into said tubular member, said housing including a hollow conical portion constituting an extension of said conical end portion and being disposed between said tubular member and said valving element; a delivery valve installed in said housing downstream of said suction valve and arranged to



open in response to flow of fluid from said tubular member via said opening; and means for alternately moving said plunger in a first direction away from said conical end portion to thereby reduce the pressure in the interior of said tubular member with attendant movement of said valving element to open position and the resulting flow of fluid from said inlet into said tubular member by way of said path, and in a second direction toward said conical end portion to thereby pressurize the fluid in said tubular member and to expel the pressurized fluid via said opening and said delivery valve.

4,174,195

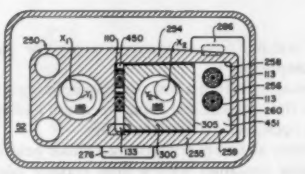
ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS

Marek J. Lassota, 4132 W. Roscoe St., Chicago, Ill. 60641

Continuation-in-part of Ser. No. 692,199, Jun. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,430, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,159, Sep. 4, 1975, Pat. No. 4,010,675, which is a continuation of Ser. No. 523,958, Nov. 14, 1974, abandoned. This application Aug. 4, 1977, Ser. No. 821,729

Int. Cl.[2] F01C *1/24, 21/12;* **F04C** *17/16;* **F16J** *1/24*

U.S. Cl. 418—1 **31 Claims**



1. A compressible fluid compressing process comprising sequentially the steps of:

opening an intake port or ports leading into a first compression chamber located between a piston, a body and spaced walls of a cylinder-piston, and axially spaced stationary walls by said cylinder-piston and said piston and as a result of planetary rotations of said cylinder-piston and said piston when said first compression chamber is at about its minimum volume;

closing an intake port or ports leading to a second compression chamber located between said piston, said two spaced walls and an interconnecting wall of said cylinder-piston, and said axially spaced stationary walls by one of said spaced walls of said cylinder-piston and as a result of said panetary rotation of said cylinder-piston when said second compression chamber is at about its maximum volume;

passing said compressible fluid to be compressed through

said intake port or ports into said first compression chamber while:

said volume of said first compression chamber increases as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston with said distance between said piston and said body of said cylinder-piston increasing; and

a discharge valve or valves of said first compression chamber are closed;

compressing said compressible fluid in said second compression chamber by decreasing said volume of said second compression chamber as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston while said distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston decreases;

opening a discharge valve or valves of said second compression chamber when the pressure of said compressible fluid compressed in said second compression chamber reaches desired level, while continuing said intake process in said first compression chamber;

passing said compressed compressible fluid from said second compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said second compression chamber continues, and while continuing said intake process in said first compression chamber;

closing said intake port or ports of said first compression chamber by a second of said spaced walls of said cylinder-piston and as a result of said planetary rotation of said cylinder-piston when said first compression chamber is at about its maximum volume;

closing said discharge valve or valves of said second compression chamber when said second compression chamber is at about its minimum volume;

opening said intake port or ports leading into said second compression chamber by said cylinder-piston and said piston and as a result of said planetary rotations of said cylinder-piston and said piston when said second compression chamber is at about its minimum volume;

compressing said compressible fluid in said first compression chamber by decreasing said volume of said first compression chamber as a result of said corrdinated and opposite planetary rotations of said piston and said cylinder-piston while said distance between said piston and said body of said cylinder-piston decreases;

passing said compressible fluid to be compressed through said intake port or ports into said second compression chamber while:

said volume of said second compression chamber increases as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston with said distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston increasing; and

said discharge valve or valves of said second compression chamber are closed;

opening said discharge valve or valves of said first compression chamber when the pressure of said compressible fluid compressed in said first compression chamber reaches desired level, and while said intake process in said second compression chamber continues;

passing said compressed compressible fluid from said first compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said first compression chamber continues, and while said intake process in said second compression chamber continues;

closing said discharge valve or valves of said first compression chamber when said first compression chamber is at about its minimum volume; and

repeating said cylcle in said first and in said second variable volume compression chambers.

4,174,196

SCREW FLUID MACHINE

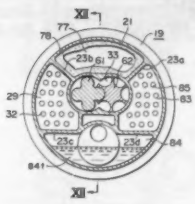
Hidetomo Mori; Katsumi Matsubara; Haruo Mishina; Akira Arai; Riichi Uchida, all of Ibaraki; Eiji Yokoyama, Kashiwa, and Hajime Arai, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1977, Ser. No. 816,185

Claims priority, application Japan, Jul. 28, 1976, 51-89117; Oct. 25, 1976, 51-127205

Int. Cl.[2] F04C *23/00, 29/02, 29/04, 29/06*

U.S. Cl. 418—9 **14 Claims**



1. A screw fluid machine, comprising:

a main casing including an outer tubular wall, an inner tubular wall, a plurality of rib members interconnecting said outer wall and said inner wall and extending from one end to the other end of said inner and outer walls to define between said inner and outer walls a plurality of spaces linearly extending from one end to the other end of said inner and outer walls, and at least one working space located inside said inner wall and having an inlet port and a discharge port, said working space having two cylindrical bores overlapped with one another;

side casings respectively coupled to the end faces of said main casing, each of said side casings having at least one passage therein communicating at least two of said plurality of spaces in said main casing with each other;

at least one pair of screw rotors housed in said working space; and

at least two accessories for the screw fluid machine housed in said plurality of spaces in said main casing.

4,174,197

ROTARY-PISTON MACHINE HAVING A LIQUID-COOLED PISTON

Wulf Leitermann, Bad Wimpfen, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,702

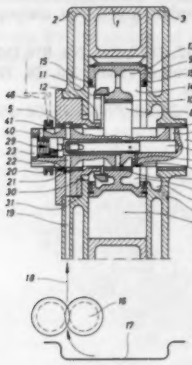
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631619

Int. Cl.[2] F01C *21/06*

U.S. Cl. 418—84 **4 Claims**

1. A rotary-piston machine, in particular a rotary-piston combustion engine of trochoid type comprising; a housing composed of at least one shell and at least two parallel end pieces and traversed perpendicular to the end pieces by an eccentric shaft mounted on bearings in the end pieces, a liquid-cooled polygonal piston rotatably mounted on the eccentric of the shaft, the piston containing cavities provided with at least one aperture near their radially inner portion, the eccentric shaft having an axial bore traversed by the liquid and communicating by way of transverse holes with the bearings and with at least one nozzle, the orifice of the nozzle being directed at the aperture of the piston cavities, control means arranged in the axial bore of the eccentric shaft for controlling the communication between the axial bore and the nozzle according the temperature of the liquid, the control means including a sleeve arranged in the axial bore and longitudinally displaceable so that the transverse hole leading to the nozzle is shut off by the sleeve below a certain temperature (idling and lower partial-load range) and opened above said temperature, and in order to

displace the sleeve in the axial bore according to the temperature, a liquid-bathed expansion element having two parts relative to each other is provided, the first part of the expansion



element connected to the sleeve and the second part of the expansion element connected to the eccentric shaft, and the sleeve being traversed by the liquid and a continuation of the sleeve in the shaft leads to a shaft bearing.

4,174,198

FOREIGN MATERIAL REMOVING DEVICE IN SYNTHETIC RESIN RECLAIMING MACHINE

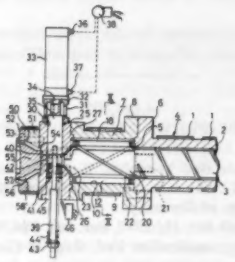
Tomoo Kinoshita, Tokyo, Japan, assignor to Nihon Repro Machine Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,602

Claims priority, application Japan, Sep. 14, 1977, 52/109953

Int. Cl.[2] B29B *1/12*

U.S. Cl. 425—135 **8 Claims**



1. A foreign material removing device in a synthetic resin reclaiming machine which comprises:

an extruder having a screw shaft;

a filter cylinder connected to the extruder and downstream thereof;

a resin filtration filter mounted within said filter cylinder so as to form a resin chamber between said filter and said filter cylinder;

a scraper shaft positioned within the filter cylinder and including projected strips as scrapers which protrude aslant to the axis of the scraper such that the strips contact the inner surface of the filter and interconnect with the screw shaft;

a body fixed to the filter cylinder downstream thereof, which includes a first guide hole, one end of the body being connected to the inside of the filter cylinder, an ejecting port, and a second guide hole disposed in an orthogonal direction with respect to the axis of the scraper so as to connect said first guide hole to said ejecting port, further including a plurality of resin passages communicating with said resin chamber;

a plurality of dies fixed to the body which include connecting passages for ejecting resin and a plurality of nozzle holes connecting to said resin ejecting passages;

a squeezing piston connected to the body which reciprocates within said second guide hole;

means for reciprocating said squeezing piston connected to said squeezing piston;

a slide piston operatively associated with said squeezing piston for contacting said squeezing piston, and

a spring member for biasing said slide piston toward said squeezing piston.

4,174,199

INJECTION-MOLDING TOOL

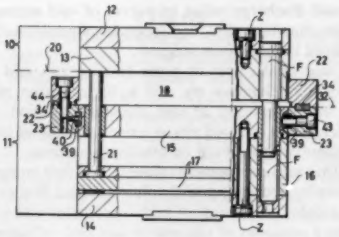
Hermann Benninghaus, Lüdenscheid, Fed. Rep. of Germany, assignor to HASCO-Normalien Hasenclever & Co., Ludenscheid, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 769,274

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605734

Int. Cl.[2] B29F *1/022*

U.S. Cl. 425—195 **9 Claims**



1. An injection mold comprising:

a first and a second die plate spacedly juxtaposed with one another and parallel to one another;

a first mold part on said first die plate and a second mold part on said second die plate, said mold parts defining a mold cavity in a closed position of the mold;

guide sleeves on one of said plates and guide bolts on the other of said plates extending transversely to a mold split between said mold parts and slidingly engaging for guiding the mold parts for relative displacement in a direction parallel to said guide bolts and sleeves, one of said mold parts comprising a pair of jaws relatively displaceable transversely to said direction on the respective die plate; and

respective guide means disposed along opposite exterior sides of the mold for guiding said jaws, each of said guide means comprising:

a retaining bar laterally affixed to said respective die plate with a surface flush with the joint between said jaws and said respective mold plate,

a guide bar affixed to said retaining bar and having a surface bearing upon of said retaining bar while forming therewith a groove slidably receiving a lateral rib on said jaws, said guide bar having a further surface bearing laterally upon said jaws, and

key means between said bars for form-fittingly connecting said together over their entire lengths.

4,174,200
APPARATUS FOR THE MANUFACTURE OF A CONTINUOUS FILM OR WEB OF THERMOPLASTIC MATERIAL

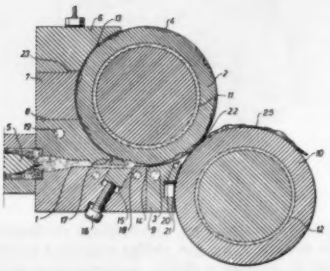
Peter Hoj, Espergärde, Denmark, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Dec. 9, 1977, Ser. No. 859,213

Claims priority, application Switzerland, Dec. 10, 1976, 15584/76

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—376 A **10 Claims**



1. An apparatus for manufacturing a continuous web of thermoplastic material, the web including a pattern of thickened portions each having a thickness which exceeds a thickness of adjoining portions of the web, comprising:

extruder means for supplying molten thermoplastic material;

a first cylindrical roll having a surface provided with a pattern of recessed portions each recessed portion having a shape, size and relative position corresponding to the thickened portions of the web;

a member having a first circular-cylindrical seat surface which is positioned immediately adjacent to, but spaced away from the surface of the first roll;

duct means for supplying the molten thermoplastic material supplied by the extruder to the space between the member and the surface of the first roll, the duct means extending through the member; and

a second cylindrical roll having a surface that is smooth and unbroken, the second cylindrical roll being positioned adjacent the first cylindrical roll to receive the web from the first roll and being at a lower temperature than the first cylindrical roll, the first and second cylindrical rolls defining a nip with the formed thermoplastic material of the first cylindrical roll passing in the nip between the first and second cylindrical rolls; and wherein

the member further includes a second circular-cylindrical seat surface which is positioned immediately adjacent to, but spaced away from the surface of the second roll.

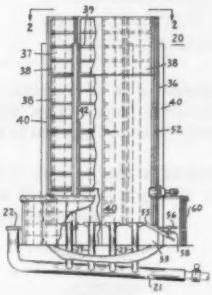
4,174,201
BURNER HEADS FOR WASTE COMBUSTIBLE GAS

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited, Jenkintown, Pa.

Continuation of Ser. No. 769,869, Feb. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 559,492, Mar. 16, 1975, Pat. No. 4,070,146. This application Jul. 26, 1978, Ser. No. 928,298

Int. Cl.[2] F23C *5/28*

U.S. Cl. 431—202 **5 Claims**



1. Combustion apparatus for use in a flare gas burner for combustible waste gas comprising

a combustion chamber open at the top and having its lower margin elevated for entry of air for combustion,

a combustible waste gas supply connection,

means at the bottom of said combustion chamber in communication with said supply connection comprising a plurality of spaced burner heads spaced above said waste gas supply connection and spaced above the lower margin of said combustion chamber,

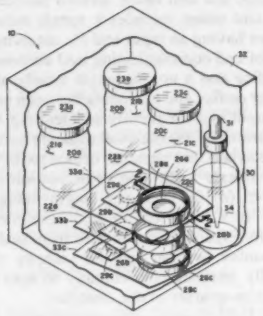
each of said burner heads having a plurality of outwardly extending tilted vanes with elongated slots for gas delivery, and

said tilted vanes of said spaced burner heads being disposed to provide a plurality of spaced vortex mixing patterns within said combustion chamber and to which air for combustion is freely accessible from the space below said lower margin.

4,174,202
KIT AND METHOD FOR TESTING LIQUIDS FOR HYDROGEN SULFIDE CONTENT

Benny E. Simpson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 28, 1977, Ser. No. 855,540
Int. Cl.[2] G01N *31/22*
U.S. Cl. 23—230 R **17 Claims**



1. A method for qualitatively determining whether or not a liquid contains hydrogen sulfide in a concentration in excess of a preselected concentration, which comprises, in sequence:

(a) admixing a preselected quantity of the liquid to be tested with a quantity of a metal cation capable of reacting with sulfide ion to form a precipitate, which quantity of cation is stoichiometrically sufficient to react with the hydrogen sulfide which would be present in said preselected quantity of liquid if said hydrogen sulfide were initially present at said preselected concentration;

(b) purging the liquid with an inert gas to remove unreacted hydrogen sulfide from the liquid;

(c) contacting a reagent colorimetrically and selectively responsive to the presence of hydrogen sulfide with the gas purged from the liquid;

(d) observing the color of the colorimetrically responsive agent, a color change in response to hydrogen sulfide being indicative that the liquid tested contained hydrogen sulfide at a concentration in excess of said preselected concentration.

4,174,203
PROCESS AND DEVICE FOR THE PRODUCTION OF SUBMICRON-SIZED METALLIC OXIDES

Werner J. Borer, Henggart, and Tomas Zuzak, Feuerthalen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 755,136, Dec. 29, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,559
Claims priority, application Switzerland, May 5, 1976, 6465/76; Fed. Rep. of Germany, Jul. 20, 1976, 2632610
Int. Cl.[2] B01D *7/00*
U.S. Cl. 23—294 R **11 Claims**

1. A process for producing submicron-sized metallic oxide particles from particles having a size within a range of 1 to 100 microns in a vaporizing zone produced by a plasma stream, a zone being disposed downstream of said vaporizing zone and including an agglomerator having an entry region, a cyclone separator being connected in series with said agglomerator, the steps comprising:

sublimating said particles in said vaporizing zone, said particles having an initial size within a range of about 1 to 100 microns;

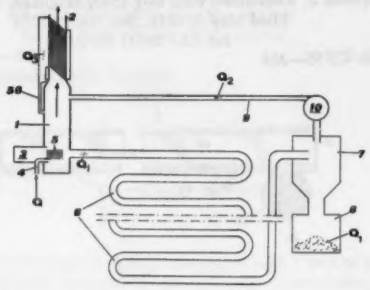
forming said submicron-sized particles having a size within the range of about 0.02 to 0.5 microns;

transporting said submicron-sized particles by means of a carrier gas to said agglomerator;

agglomerating said submicron-sized particles in said agglomerator so as to form loose agglomerates in which said submicron-sized particles are held together by electrostatic forces;

transporting said agglomerated submicron-sized particles by means of said carrier gas to said cyclone separator;

centrifuging said agglomerated submicron-sized particles in



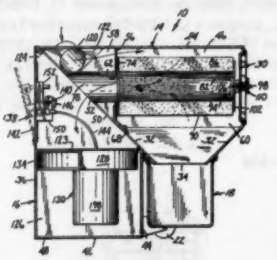
said cyclone separator so as to separate out at least a portion of said agglomerated submicron-sized particles from the fines of said agglomerated submicron-sized particles; and

recirculating said fines of said agglomerated submicron-sized particles to said entry region of said agglomerator for further agglomeration.

4,174,204
PULSE JET CLEANED AIR FILTER ASSEMBLY WITH INTEGRAL AIR COMPRESSOR

Frank R. Chase, Excelsior, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 4, 1978, Ser. No. 931,017
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—283 **13 Claims**



5. In combination with an air cleaner having a housing with a partition therein dividing the interior of the housing into a clean air chamber and a dust-laden air chamber with the partition having an opening providing fluid communication between the two chambers, a filter means disposed within the dust-laden air chamber for filtering the air passing through the opening in the partition from the dust-laden air chamber to the clean air chamber, a fan mounted within the housing for drawing air through said housing from a dust-laden air inlet which opens into the dust-laden air chamber to a clean air outlet which opens into the clean air chambers, means for cleaning the filter means comprising:

(a) a compressor mounted within said housing;

(b) means for driving said compressor directly from the fan; and

(c) regulated valve means connected to said compressor for automatically and periodically directing a pulse of com-

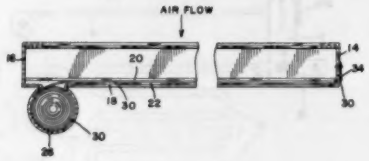
pressed air from said compressor to said filter means to remove the collected dust therefrom.

4,174,205

FURNACE AIR FILTER

Nicholas J. Koushiafes, P.O. Box 1543, Highland, Ind. 46322

Filed May 3, 1978, Ser. No. 902,274
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—354 **6 Claims**



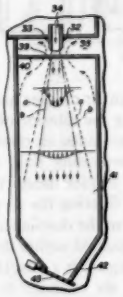
1. An apparatus for removing solid material from an air stream which is subjected to heat exchange to produce air useful for heating or cooling purposes, said apparatus comprising: filter frame means defining a filter area through which said air flows, supply means located in proximity to said frame means to supply filter medium to said filter area, said medium being constructed to remove solid material from said air stream as said air stream flows through said filter area, said filter frame means and said supply means co-operating so that filter medium which is removed from said filter area is replaced by filter medium from said supply means, and a cutting edge attached to one end of said frame means to cut filter medium being removed from said filter area from filter medium within said filter area.

4,174,206

APPARATUS FOR SEPARATING PARTICULATE MATERIAL FROM AN AIRSTREAM

George T. Dupré, Palatine, and Thomas M. DeMarco, Chicago, both of Ill., assignors to NFE International Ltd., Palatine, Ill.

Continuation of Ser. No. 474,000, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 323,130, Jan. 12, 1973, abandoned, which is a continuation of Ser. No. 109,246, Jan. 25, 1971, abandoned. This application Jan. 26, 1978, Ser. No. 872,658
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—434 **2 Claims**



1. In apparatus for the collection of airborne particulate material from a stream of air, which includes an elongated enclosed chamber sealed at its bottom and having a chamber orifice at the top into which a stream of air is directed along the chamber length, defined between the chamber orifice and the chamber bottom, to avoid turbulence at the bottom of the chamber, the particulate matter being collected in the chamber while the airstream exits through the chamber orifice at the top of the chamber, wherein the improvement comprises:

means for gradually separating particulate material from an airstream and thereby improving the efficiency of collection of finely divided particles of particulate materials from an airstream containing a mixture of particle sizes and kinds, and said finely divided particles; and,

wherein said means includes a nozzle mounted above said chamber having an input end for receiving said airstream, an outlet end communicating said airstream to said chamber orifice and a nozzle length axially aligned with said chamber orifice and extending between said input end and said output end for rapidly accelerating said airstream;

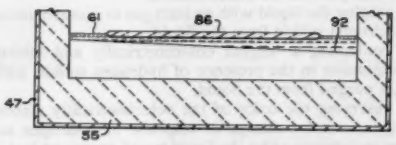
the dimensions of: (a) the axial distance between said nozzle outlet end and said chamber orifice to (b) the cross section of said nozzle to (c) the cross section of said chamber orifice to (d) the chamber length being in the ratio of about 1:10:30:90 to enable said accelerated airstream to gradually expand as it traverses from said orifice towards the chamber bottom, and the velocity of said airstream gradually dissipates substantially to zero before reaching the bottom quarter of the chamber.

4,174,207

METHOD AND APPARATUS UTILIZING TRANSVERSELY INCLINED BARRIERS IN FLOAT GLASS FORMATION

Robert Gagne, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 26, 1978, Ser. No. 928,046
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A **18 Claims**



1. In a flat glass-forming chamber including an enclosed chamber containing a pool of glass-supporting molten metal, means for delivering molten glass onto the pool of molten metal at an inlet end, means for removing a continuous sheet of glass from the pool of molten metal and from the chamber at an outlet end, means for advancing glass along the surface of the molten metal from the inlet end to the outlet end of the chamber while forming it into a continuous sheet of desired width and thickness and means for removing heat from the glass during its advance and for removing heat from the chamber, wherein there is provided in the pool of molten metal at least one barrier over which the glass can advance, the improvement which comprises:

an asymmetric barrier extending traversely of said chamber beneath said molten metal wherein the upper surface of said barrier is close to the surface on one margin of said molten metal bath and slopes transversely to farther below the surface of said metal at the other margin to create asymmetric flow transverse of the bath.

14. In a method of improving longitudinal distortion in the making of flat glass comprising the steps of delivering molten glass onto the surface of a pool of molten metal in an enclosed forming chamber, advancing the glass in a layer along a path on the surface of the pool of molten metal from an inlet region to an outlet region while cooling the glass and applying forces to it to form it into a dimensionally stable, continuous sheet of glass and removing the continuous sheet of glass from the surface of the pool of molten metal and from the forming chamber wherein the molten metal upon which the glass advances has flows within it along paths which are at least partially aligned with the path of glass advance, including both

flows with and flows counter to the advance of the glass, the improvement which comprises providing an asymmetric barrier sloping transversely of said chamber beneath said molten metal creating molten metal flows that are asymmetric transverse of said chamber.

4,174,208

HERBICIDAL COMPOSITIONS

Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia E. Fischer, heiress), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 627,965, Nov. 3, 1975, Pat. No. 4,057,414. This application Aug. 29, 1977, Ser. No. 828,289

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1974, 2454576

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **8 Claims**

1. A herbicide composition comprising an inert carrier having dispersed therein a herbicidially effective amount of a mixture consisting essentially of:

(a) O-(methylaminosulfonyl)-glycolic acid-N-isopropylanilide,

(b) 1-phenyl-4-amino-5-chloropyridazone-(6), and

(c) a compound selected from the group consisting of

3-methoxycarbonylaminophenyl-N-(3'-methylphenyl)-carbamate,

3-(N-m-trifluoromethylphenylcarbamoyloxy)-(p-methylphenyl)-methylcarbamate, and

3-(N-m-methylphenylcarbamoyloxy)-acetoacetic acid anilide in a weight ratio of a:b:c of 1:0.5 to 2:0.5 to 2.

4,174,209

HERBICIDAL 1-ALKYL-3-PHENYLPYRIDINIUM SALTS

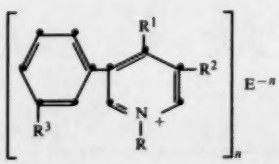
Harold M. Taylor, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 19, 1978, Ser. No. 917,038

Int. Cl.[2] C07D *213/26, 213/28;* A01N *9/22*

U.S. Cl. 71—94 **32 Claims**

1. A compound of the formula



wherein R represents methyl or ethyl;

R^1 represents halo, methoxy, or dimethylamino;

R^2 represents hydrogen, phenoxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, phenyl or phenyl monosubstituted with chloro, bromo, fluoro, trifluoromethyl, C_1–C_3 alkyl or C_1–C_3 alkoxy;

R_3 represents C_1–C_3 alkyl, C_1–C_3 alkoxy, trifluoromethyl, chloro, fluoro or bromo;

E represents an anion capable of forming a pyridinium salt; and

n represents an integer of 1 to 3.

21. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with a herbicidally-effective amount of a compound of claim **1**.

4,174,210

HERBICIDAL AND PLANT-GROWTH REGULATING N-HALOACETYLPHENYLAMINO CARBONYL OXIMES

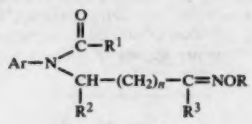
William L. Schinski, San Rafael; Irene C. Huang, Pinole, and David C. K. Chan, Petaluma, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1978, Ser. No. 892,365

Int. Cl.[2] A01N *9/20;* C07C *103/34*

U.S. Cl. 71—118 **8 Claims**

1. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, iodo, or alkyl of 1 to 4 carbon atoms, or substituted with 1 to 2 of the same or different substituents selected from alkoxy of 1 to 4 carbon atoms, nitro or haloalkyl of 1 to 2 carbon atoms and 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; R^1 is halomethyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; n is 0 or 1; and R is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, phenyl, benzyl, or phenyl or benzyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro and R^2 and R^3 are joined together to form a carbocyclic ring of 5 to 6 carbon atoms.

4,174,211

PROCESS FOR MANUFACTURING COMPOSITE POWDER FOR POWDER METALLURGY

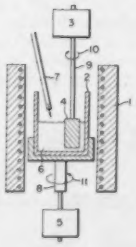
Taizo Ohmura, Ohmiya; Noboru Yonezawa, Urawa, and Kazuo Ikuta, Kawagoe, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1978, Ser. No. 894,336

Claims priority, application Japan, Apr. 23, 1977, 52-46349

Int. Cl.[2] B22F *9/00*

U.S. Cl. 75—0.5 B **16 Claims**



1. A process for manufacturing a fine composite powder for powder metallurgy comprising a core metal powder and many particles of a covering powder adhering to the entire surface of each particle of said core metal powder, characterized by comprising the steps of:

putting a core metal in at least a semi-molten state, which is to be pulverized, in a vessel in coexistence witha covering powder in a solid state, said covering powder consisting of a materialwhich has a higher melting point than said core metal and is difficult to chemically react with said core metal and/or difficult to form a solid solutionwith said core metal, said covering powder being selected in response to the chemical composition of a sintered alloy to

be produced, and the temperature of said at least semi-molten core metal being lower than the melting point of said covering powder;

mixing said at least semi-molten core metal and said solid covering powder by stirring so as to ensure uniform dispersion of said solid covering powder in said at least semi-molten core metal; and then,

slowly cooling said at least semi-molten core metal and said solid covering powder, while continuing said stirring, until the temperature of said at least semi-molten core metal reaches at least its solidus point, to pulverize said core metal into a fine powder and to form a composite powder for powder metallurgy having a structure in which many particles of said covering powder adhere to and cover the entire surface of each particle of said fine powder of said core metal.

4,174,212

METHOD FOR THE REFINING OF STEEL

Hannsgeard G. Bauer; Manfred Walter, and Erick Heimrich, all of Witten, Fed. Rep. of Germany, assignors to A. Finkl & Sons Co., Chicago, Ill.

Filed Mar. 10, 1978, Ser. No. 885,114
Int. Cl.[2] C21C *5/34, 7/10*
U.S. Cl. 75—49 **7 Claims**

1. In a method of making stainless steel having a carbon content of 0.03% or less, the steps of

adding gaseous oxygen to a heat of molten steel containing carbon and chromium until the carbon content of the heat has decreased to about 0.2% to 0.4%,

said gaseous oxygen being added at atmospheric pressure,

terminating the addition of gaseous oxygen after the carbon content of the heat has dropped to about 0.2% to about 0.4%, and

thereafter subjecting the heat containing about 0.2% to 0.4% carbon to the simultaneous effects of,

firstly, inert gas agitation, and,

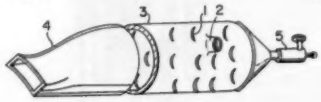
secondly, sub-atmospheric pressure, until the desired final carbon content is reached.

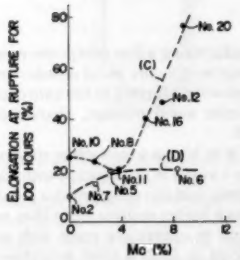
4,174,213

HIGHLY DUCTILE ALLOYS OF IRON-NICKEL-CHROMIUM-MOLYBDENUM SYSTEM FOR GAS TURBINE COMBUSTOR LINER AND FILLER METALS

Yutaka Fukui; Fumio Hataya, and Tetsuo Kashimura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 1, 1978, Ser. No. 882,455
Claims priority, application Japan, Mar. 4, 1977, 52-22666
Int. Cl.[2] C22C *19/00, 28/00*
U.S. Cl. 75—134 F **34 Claims**





11. An alloy of iron-nickel-chromium-molybdenum system having a high ductility, which consists essentially of 0.05–0.15% by weight of carbon, 0.5–1.5% by weight of silicon, 0.5–2% by weight of manganese, 44–50% by weight of nickel, 22–30% by weight of chromium, 5–10% by weight of molybdenum, 0.2–0.6% by weight of at least one of titanium and niobium as an additive element, 0.3–5% by weight of at least one of tungsten and cobalt as an intensifying element, and 15–25% by weight of iron, the balance being incidental impurities.

4,174,214

WEAR RESISTANT MAGNESIUM COMPOSITE

Foster C. Bennett, and Sidney L. Couling, both of Columbus, Ohio, assignors to Rheocast Corporation, Milwaukee, Wis.

Filed May 19, 1978, Ser. No. 907,747
Int. Cl.[2] C22C *33/00;* B32B *15/14*
U.S. Cl. 75—168 R **11 Claims**

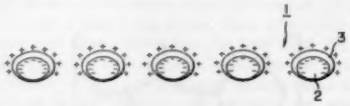
1. A solid composite with a magnesium or magnesium alloy matrix with degenerate dendrites therein and up to about 30 weight percent solid, substantially insoluble oxide particles dispersed in the matrix, the oxide being selected from at least one member of the group consisting of aluminum oxide and magnesium oxide.

4,174,215

ELECTROPHOTOGRAPHIC SCREEN

Yujiro Ando, Yokohama; Katsunobu Ohara, and Keiji Tanaka, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 789,539, Apr. 21, 1977, abandoned, which is a division of Ser. No. 715,821, Aug. 19, 1976, abandoned, which is a continuation of Ser. No. 469,892, May 14, 1974, Pat. No. 3,976,484. This application Sep. 5, 1978, Ser. No. 939,232
Claims priority, application Japan, May 23, 1973, 48-57389; Jun. 19, 1973, 48-69344; Nov. 9, 1973, 48-126038
Int. Cl.[2] G03G *5/04*
U.S. Cl. 430—68 **4 Claims**



1. A photosensitive screen comprising:

a conductive base member having a plurality of fine openings; and

a photoconductive surface layer covering one side of said conductive base member and extending continuously into and through the openings to cover (a) the inner peripheries of the conductive base openings, and to cover (b) the other side of said conductive base while leaving a portion thereof uncovered, said screen being contoured such that when the photoconductive layer is electrically charged and exposed to light at said one side thereof, said portions of the photoconductive layer extending from about half the depth of the openings to the other side of said conductive base do not become conductive but remain electrically insulative, thereby retaining an electrical charge thereon.

4,174,216

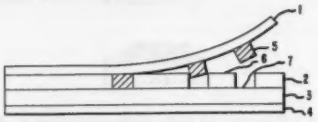
PROCESS FOR IMAGE REPRODUCTION USING MULTILAYER PHOTOSENSITIVE TONABLE ELEMENT

Abraham B. Cohen, Springfield, and Roxy N. Fan, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 747,027, Dec. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 583,456, Jun. 3, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 915,063

Int. Cl.² G03C *5/00, 1/94*

U.S. Cl. 430—257 **20 Claims**



1. An image reproduction process which comprises

(1) exposing imagewise to actinic radiation a peel apart photosensitive element comprising, in order, from top to bottom (a) a strippable cover sheet, (b) a photoadherent layer comprising a material with ethylenically unsaturated or benzophenone type groups, (c) a tonable organic contiguous layer, and optionally (d) a sheet support;

(2) stripping the cover sheet from the element with either the exposed or unexposed areas of the photoadherent layer adhered to the cover sheet while the other areas of said photoadherent layer remain on said contiguous layer; and

(3) toning by embedding colorant or particulate material into the areas of the contiguous layer from which areas of the photoadherent layer were removed.

4,174,217

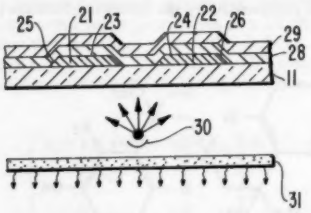
METHOD FOR MAKING SEMICONDUCTOR STRUCTURE

Doris W. Flatley, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,179

Int. Cl.² H01L *21/84, 21/86*

U.S. Cl. 96—36.2 **14 Claims**



1. A method for making a protective barrier for selected exposed portions of P-N epitaxial semiconductor island consisting of semiconductive material and conductivity modifiers appositioned to a substrate, said island having a top extending along the thickest portion of the island and an edge extending from the top along thinner portions of the island, said method comprising the steps of:

preselecting the thickest portion of the semiconductor island such that said portion absorbs a preselected intensity of ultraviolet radiation of a particular wavelength,

coating surfaces of the semiconductor island with a protective material which material is transmissive to said ultraviolet radiation,

coating the protective material with a material which is responsive to said radiation for providing a masking layer on said semiconductor island which masking layer is selected by exposure to the radiation,

irradiating the radiation responsive material with said radiation of a preselected intensity through the substrate from the side opposite the substrate surface hving a semiconductor island thereon, the thickest portion of the semiconductor island substantially absorbing the radiation of the preselected intensity, all of the thinner portions of the semiconductor island transmitting the radiation of the preselected intensity, thereby exposing all of said radiation responsive material above the thinner portions to the radiation, and

further irradiating said radiation responsive material for an additional preselected time thereby exposing a predetermined area of the masking layer which area extends above the thickest portion of the island from the edge.

4,174,218

RELIEF PLATES FROM POLYMER WITH TERMINAL UNSATURATION

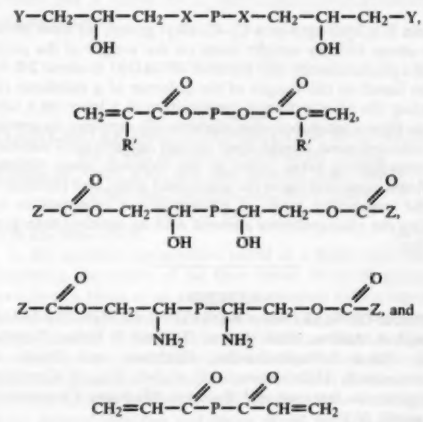
Rudolph L. Pohl, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 810334, Jun. 27, 1977, Pat. No. 4,137,081, which is a continuation-in-part of Ser. No. 628,862, Nov. 5, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,281

Int. Cl.² G03C *5/00, 1/78, 1/96, 1/68*

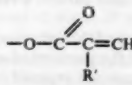
U.S. Cl. 430—306 **3 Claims**

1. The process of making a printing relief which comprises (1) admixing (a) a liquid terminal olefinically unsaturated linear polymer having a molecular weight in the range of from 1,000 to 20,000 selected from polymers having the structure

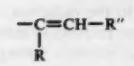


where X is selected from —O—, —S—,

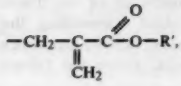
and —NH— groups; Y is selected from —O—CH$_2$—CH=CH$_2$ and



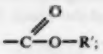
R′ is selected from —H and —CH$_3$ groups; Z is selected from



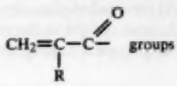
and



where R'' is selected from —H, —CH_3 and



and P is a polymer residue selected from homopolymers of butadiene, isoprene, chloroprene, styrene, isobutylene, ethylene, and copolymers of butadiene with acrylonitrile, butadiene with styrene, butadiene with isoprene, ethylene with neohexene, isobutylene with styrene, isobutylene with acrylonitrile, and the corresponding saturated residues; (b) from about 1 to about 50% by weight based on the weight of the polymer of at least one ethylenically unsaturated monomer selected from acrylonitrile, methacrylonitrile, styrene, methyl substituted styrene and monomers containing one or more



wherein R is hydrogen or a C_1–C_3 alkyl group; (c) from about 0.1 to about 10% by weight based on the weight of the polymer of a photoinitiator, and (d) from about 0.01 to about 2% by weight based on the weight of the polymer of a stabilizer; (2) spreading the photopolymer composition in a layer on a support to form a photopolymer element, (3) exposing to actinic light selected areas of said layer on said support until substantial cross-linking takes place in the exposed areas without significant cross-linking in the unexposed areas, and (4) removing the unexposed areas of photopolymer composition by washing the photopolymer element with an aqueous detergent solution.

4,174,219

METHOD OF MAKING A NEGATIVE EXPOSURE MASK

Heinrich A. Andres, Rheinstetten; Hartmut F. Kolbe, Boeblingen; Horst Schlagdenhaufen, Grafenau, and Frank A. Schwarzbach, Hildrizhausen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,741

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658400

Int. Cl.[2] **G03C** *5/00;* **C23F** *1/02;* **G03C** *5/50;* **B32B** *31/28*

U.S. Cl. 430—321 **8 Claims**

1. A method of making an exposure mask comprising:

forming on a transparent substrate a positive pattern of masking material which is opaque to UV light, said material being selected from the group consisting of metals and inorganic metallic compounds,

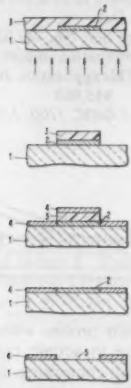
forming on said substrate and pattern a resist layer of positive photoresist,

exposing said resist layer to UV light through the back of said substrate such that the portions of said resist layer in contact with the substrate are exposed,

developing said resist layer so as to remove the exposed portions of said resist layer,

depositing a second layer of masking material, which is opaque to UV light, on the substrate and on the remaining portions of the resist layer,

removing the remaining portions of the resist layer and the overlying masking material, and



removing the positive pattern of masking material to leave a negative pattern of said second layer of masking material on said substrate.

4,174,220

COLOR PHOTOGRAPHIC MATERIALS CONTAINING DYE FADING INHIBITORS

Masahiko Taguchi; Katsuo Mogaki, and Syun Takada, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 846,127

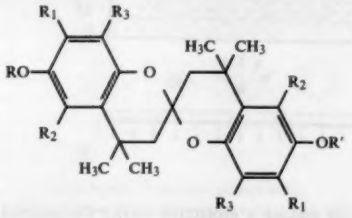
Claims priority, application Japan, Oct. 30, 1976, 51-130742

Int. Cl.[2] **G03C** *1/76, 1/06, 1/40*

U.S. Cl. 430—613 **21 Claims**

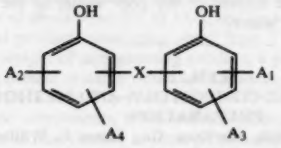
1. A color photosensitive material comprising a support and a silver halide photosensitive layer which material comprises a compound represented by the following formula (I)

Formula (I)



wherein R_1 is an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an alkenoxy group or an aryloxy group; R_2 and R_3 are individually hydrogen, halogen, or an alkyl group, an alkenyl group or an alkoxy group; R is an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a member selected from the group consisting of imidazolyl, furyl, pyridyl, and thiazolyl, or R_6CO—, R_7SO_2— or R_8NHCO—; and R' is hydrogen, or R_6CO—, R_7SO_2— or R_8NHCO— wherein R_6, R_7 and R_8 are individually an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a member selected from the group consisting of imidazolyl, furyl, pyridyl, and thiazolyl, in combination with a compound represented by the following formula (II).

Formula (II)



wherein A_1, A_2, A_3 and A_4 are individually an alkyl group having 1–18 carbon atoms, the total number of carbon atoms of A_1, A_2, A_3 and A_4 being not more than 32; and X is a simple bond, oxygen, sulfur, sulfonyl or

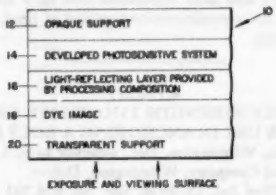
in which A_5 is hydrogen or an alkyl group having 1–10 carbon atoms and n is an integer of 1 to 3.

4,174,221

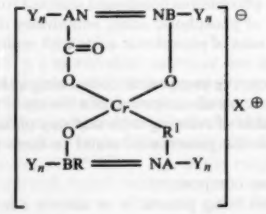
YELLOW 2:1 CHROME COMPLEXED DYE DEVELOPERS

Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,076
Int. Cl.[2] G03C *7/00, 1/40, 1/10, 5/54*
U.S. Cl. 430—225 **52 Claims**



1. A photographic film unit which comprises a photosensitive system including a silver halide emulsion layer associated with a 2:1 chrome-complexed yellow dye developer of two ortho carboxy, ortho' hydroxy azo dyes or a 2:1 chrome-complexed yellow dye developer of an ortho carboxy, ortho' hydroxy azo dye and an ortho, ortho' dihydroxy azomethine dye, said dye developer having the following structure:



where each A is a phenyl radical; each B is a phenyl or nitrogen containing heterocyclic radical; Y is a silver halide developing substituent; each n is 0 or 1 but at least one n must be 1; R is N or CH; R^1 is

if R is N but R^1 is —O— if R is CH; and X is a cation.

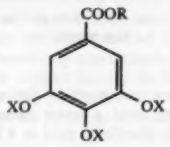
4,174,222

POSITIVE-TYPE O-QUINONE DIAZIDE CONTAINING PHOTORESIST COMPOSITIONS

Takashi Komine, Yokohama; Akira Yokota, Yamato; Hisashi Nakane, Kawasaki; Shingo Asaumi, Fujisawa, and Noboru Okazaki, Chigasaki, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 660,432, Feb. 23, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,260
Claims priority, application Japan, May 24, 1975, 50/62412
Int. Cl.[2] G03C *1/54;* **C03C** *1/70*
U.S. Cl. 430—190 **8 Claims**

1. A positive-type photoresist composition which comprises as essential ingredients an alkali-soluble phenolic novolac resin in an amount sufficient to give etching resistance to the composition and at least one naphthoquinonediazido derivative of the general formula



in an amount sufficient to make the composition photodecomposable wherein R stands for a substituent selected from the group consisting of alkyl, aryl and nucleus-substituted aryl groups and X stands for a naphthoquinone-(1,2)-diazido-(2)-sulfonyl residue.

4,174,223

FLAME RETARDANT COMPOSITIONS AND METHODS OF PREPARING AND USING SAME

Donald M. Steen, P.O. Box 295, Morrill, Nebr. 69358

Filed Jun. 13, 1978, Ser. No. 915,156
Int. Cl.[2] C09K *3/28*
U.S. Cl. 106—18.16 **11 Claims**

1. An aqueous composition useful as a flame retardant and consisting essentially of (a) from about 10 to 60 percent by weight of a blend of an aqueous ammonium nitrate liquor and an aqueous urea liquor compounded so that the blend contains approximately 40–60% of the total nitrogen from each of said ammonium nitrate and urea and a total of about 28 to 32 percent nitrogen, and (b) from about 10 to about 50 percent of an aqueous ammoniated poly phosphate solution containing about 8–12 percent nitrogen and about 30–40 percent phosphoric acid.

8. A flame retardant insulation material formed by the mixing of constituents comprising (a) a cellulose material selected from the group consisting of ground newsprint, shredded wood fiber, straw, cotton batting or mixtures thereof and (b) a flame retardant composition consisting essentially of (i) from about 10 to 60 percent by weight of a blend of an aqueous ammonium nitrate liquor and an aqueous urea liquor compounded so that the blend contains approximately 40–60 percent of the total nitrogen from each of said ammonium nitrate and urea and a total of about 28 to 32 percent nitrogen, and (ii) from about 10 to about 50 percent of an aqueous ammoniated poly phosphate solution containing about 8–12 percent nitrogen and about 30–40 percent phosphoric acid, said flame retardant comprising about 10 to about 40 percent of the total mixture.

4,174,224

SAND MOLD COMPOSITION

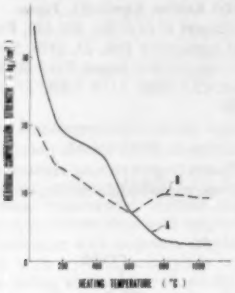
Sigeru Seki, Urawa; Tatsuhiko Noguchi, Iwaki; Minoru Ohta, Iwaki, and Ryuichi Kurita, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,546

Claims priority, application Japan, Aug. 26, 1977, 52-101530

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.3 **5 Claims**



1. A self-hardening composition for making sand molds comprising a molding sand, a water glass as a binder and at least one salt of imidodisulfonic acid as a hardener.

4,174,225

MANUFACTURING MOULDS OR MOULD CORES

Bert K. G. Lundgren, Nynashamn, and Urban Westin, Saltsjobaden, both of Sweden, assignors to AB Nynas-Petroleum and AB Westin and Backlund, both of Stockholm, Sweden

Filed Apr. 11, 1977, Ser. No. 786,305

Claims priority, application Sweden, Apr. 12, 1976, 7604259; Jan. 17, 1977, 7700435

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.6 **8 Claims**

1. In a method of manufacturing casting moulds or mould cores comprising shaping an aqueous mixture of

(a) a moulding sand,

(b) a binding agent, and a carbonaceous material consisting of

(c) a black coal flour capable of forming lustrous carbon when the mould or mould core is heated by contact with molten metal,

without previous hardening or drying, the mould material or mould core material being recycled to manufacture fresh moulds or mould cores by adding supplementary binding agent and carbonaceous material to replace binding agent and carbonaceous material consumed during a preceding casting operation; the improvement which comprises adding, in place of the black coal flour, a combination of:

(1) a water-free, hydrocarbon-containing substance having a carbon content of 50–95%, a hydrogen-content of more than 6.8% and an ash-content of less than 4.0%, which substance when heated forms minor quantities of coke and no carcinogenic polynuclear aromatic hydrocarbons such as benzo-a-pyrene said hydrocarbon containing substance comprising a resin product obtained by oxidative polymerization, either with or without catalysts, of a mineral oil distillate or solvent extract having a content of aromatically-bound carbon corresponding to a VGC-value of at least 0.85 and a mean molecular weight of 150–600, which resin product has an initial boiling point of at least 300° C. at 750 mm Hg, and

(2) a fine, porous, hydrophilic, heat-resistant inorganic material having open pores and a specific surface area of at least 100 m^2/g, the amount of said inorganic material being sufficient to compensate for the poor ability of the moulding material to retain water as a result of the small amount of coke formed or the poor ability of the coke formed to bind water.

4,174,226

REFRACTORY MIX COMPOSITION AND METHOD OF PREPARATION

Thomas H. Fitzpatrick, Martinez, Ga.; James E. Williamson, Jr., Belvedere, S.C., and Walter H. Alexanderson, Augusta, Ga., assignors to The Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 833,627, Sep. 15, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 950,958

Int. Cl.[2] C04B *35/02*

U.S. Cl. 106—64 **6 Claims**

1. A single package, dry refractory mix, which exhibits extended shelf life under conventional storage conditions and does not require an inhibitor, which sets upon the addition of water, and which exhibits high abrasion resistance when set, consisting essentially of:

(a) 40 to 70 weight percent of an inert refractory aggregate,

(b) 15 to 35 weight percent of an aluminous material selected from the group consisting of calcined alumina, calcined bauxite and kaolin calcine,

(c) 2 to 10 weight percent hydrated alumina,

(d) 1 to 10 weight percent calcium aluminate cement, and

(e) 3 to 15 weight percent of 115 percent polyphosphoric acid;

prepared by a process comprising the steps of introducing the dry ingredients into a mixer, mixing the dry ingredients, adding the acid ingredient to the mixture of dry ingredients, and subjecting the dry and acid ingredient mix to a high intensity mixing action for a predetermined period of time, not exceeding four minutes.

4,174,227

HIGH-EARLY-STRENGTH PHOSPHATE GROUTING SYSTEM FOR USE IN ANCHORING A BOLT IN A HOLE

Ernst A. Tomic, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1978, Ser. No. 926,701

Int. Cl.[2] C04B *19/00*

U.S. Cl. 106—85 **15 Claims**

1. In a grouting system for use in a hole in combination with a reinforcing member wherein a hardened grout is formed around the reinforcing member in the hole by the reaction of the mixed components of a hardenable inorganic grouting product, thereby anchoring the reinforcing member in the hole, the improvement comprising an inorganic grouting product comprising

(a) an acidic reactive component comprising at least one acidic oxy phosphorus compound selected from the group consisting of phosphoric acids, anhydrides of phosphoric acids, and salts of phosphoric acids with multivalent metal cations;

(b) a basic reactive component comprising at least one particulate basic metal compound of a Group II or Group III metal capable of reacting with said oxy phosphorus compound(s) in the presence of water to form a monolithic solid; and

(c) an aqueous component;

said components being present in or outside a hole in a separated condition such that any substantial hardening reaction between the acidic and basic components is prevented, and when present outside the hole being adapted to be delivered into the hole separately or in a freshly combined condition; said basic metal compound(s) having a particle surface area of up to about 40 square meters per gram and constituting about from 5 to 35 percent of the total weight of said grouting product, with the proviso that when the particles of said basic metal compound(s) have a surface area of less than 1 square meter per gram, more than about 95 percent of said particles pass through a 200 mesh screen; the ratio of the moles of said basic

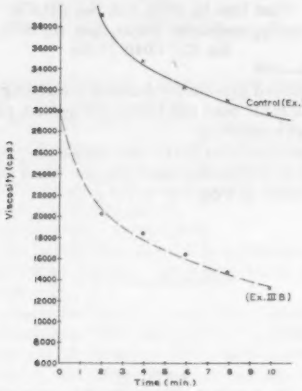
metal compound(s) to the moles of phosphorus pentoxide on which said oxy phosphorus compound(s) are based being in the range of about from 2/1 to 17/1; the amount of water present in said product constituting about from 3 to 20 percent of the total weight of said grouting product; a particulate aggregate being present in said product in an amount such as to constitute about from 30 to 70 percent of the total weight of said product; and the components, when mixed, reacting without the application of heat thereto to form a hardened grout having a pull strength of at least about 175 kilograms per centimeter of anchoring length within an hour.

4,174,228

CEMENTITIOUS MAGNESIA COMPOSITIONS CONTAINING SALTS OF ORGANO-SILANOLS

William G. Boberski; Wen-Hsuan Chang, both of Gibsonia, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,109
Int. Cl.[2] C04B *9/02, 9/04*
U.S. Cl. 106—107 **66 Claims**



1. A moldable, castable or sprayable cementitious composition, comprising:

(a) magnesium oxide;

(b) a magnesium salt having at least moderate solubility in water;

(c) at least one water-soluble organo-silanol salt, characterized in having attached to the silicon atom (i) at least one group comprising a water-soluble salt having the general formula:

$$O^-A^+$$

where A^+ is a monovalent cation or one equivalent of a polyvalent cation and (ii) at least one group comprising an organo moiety attached to the silicon atom through a substantially non-hydrolyzable silicon-carbon bond with the organo moiety further characterized in having a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and

(d) a liquid phase comprising water;

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level or organo-silanol salt ranges from about 0.5 percent to about 10 percent by weight of the magnesium oxide and the level of water is in an amount effective to cause reaction of at least a portion of said magnesium oxide and at least a portion of said magnesium salt to form a matrix curable to a hardened state.

28. A process for forming an article from a curable cementitious composition, comprising:

(a) mixing together in the presence of a liquid phase having water sufficient to produce a moldable, curable slurry composition, the components of:

(1) magnesium oxide;

(2) at least one magnesium salt having moderate solubility in water; and

(3) at least one water-soluble organo-silanol salt, characterized in having attached to the silicon atom (i) at least one group comprising a water-soluble salt having the general formula:

$$O^-A^+$$

where A^+ is a monovalent cation or one equivalent of a polyvalent cation and (ii) at least one group comprising an organo moiety attached to the silicon atom through a substantially non-hydrolyzable silicon-carbon bond with the organo moiety further characterized in having a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal.c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal.c.c.)$^{\frac{1}{2}}$ per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level of organo-silanol salt ranges from about 0.5 percent to about 10 percent by weight of the magnesium oxide

(b) placing said slurry composition in a mold form; and

(c) allowing said composition to cure sufficiently such that said article may be removed from the mold form without substantially adversely affecting the integrity of the molded article.

4,174,229

MAGNESIUM OXIDE CEMENTITIOUS COMPOSITIONS CONTAINING HYDROLYZABLE ORGANO-SILICON COMPOUNDS

William G. Boberski; Wen-Hsuan Chang, both of Gibsonia; Victor G. Petracca, Apollo, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,110
Int. Cl.[2] C04B *9/02, 9/04*
U.S. Cl. 106—107 **52 Claims**

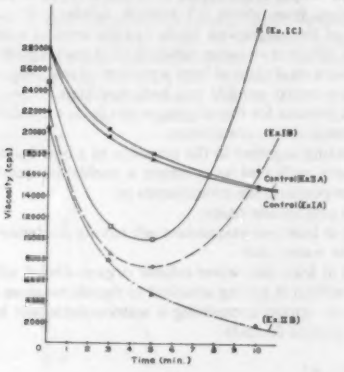
1. A moldable, castable or sprayable cementitious composition, comprising:

(a) magnesium oxide;

(b) a magnesium salt having at least moderate solubility in water;

(c) at least one organo-silicon compound, characterized in having attached to the silicon atom (i) at least one group having a hydrolyzable bond with the silicon atom and selected from the group consisting of halogen, hydroxyl, alkoxyl, aryloxyl, substituted aryloxyl, aralkoxyl, substituted aralkoxyl, alkylamino, substituted alkylamino, silylamino, substituted silylamino, mercapto and substituted mercapto and (ii) at least one moiety attached through a substantially non-hydrolyzable silicon-carbon

bond, wherein the moiety has a working parameter of



solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole; and (d) a liquid phase comprising water;

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1, the level of organo-silicon compound ranges from about 0.5 percent to 10 percent by weight of the magnesium oxide and the water is in an amount effective to cause reaction of at least a portion of said magnesium oxide and at least a portion of said magnesium salt to form a matrix curable to a hardened state.

24. A process for forming an article from a curable cementitious composition, comprising:

(a) mixing together in the presence of a liquid phase having water sufficient to produce a moldable, curable slurry composition from the components of:

(1) magnesium oxide;

(2) at least one magnesium salt having moderate solubility in water; and

(3) at least one organo-silicon compound, characterized in having attached to the silicon atom (i) at least one group having a hydrolyzable bond with the silicon atom and selected from the group consisting of halogen, hydroxyl, alkoxyl, aryloxyl, substituted aryloxyl, aralkoxyl, substituted aralkoxyl, alkylamino, substituted alkylamino, silylamino, substituted silylamino, mercapto and substituted mercapto and (ii) at least one moiety attached through a substantially non-hydrolyzable silicon-carbon bond, wherein the moiety has a working parameter of solubility, δ_{wp}, in the range of about 6.2 to about 8.0 (cal./c.c.)$^{\frac{1}{2}}$, with

$$\delta_{wp} = \frac{\Sigma F_i}{\Sigma V_i}$$

wherein:

F_i=the molar attraction constant of an individual functional group of said moiety expressed in (cal. c.c.)$^{\frac{1}{2}}$per mole, and

V_i=the molar volume constant of an individual group of said moiety expressed in c.c. per mole

wherein the mole ratio of the magnesium oxide to the magnesium salt ranges from 3:1 to 10:1 and the level of organo-silicon compound ranges from about 0.5 percent to 10 percent by weight of the magnesium oxide

(b) placing said slurry composition in a mold form; and

(c) allowing said composition to cure sufficiently such that said article may be removed from the mold form without substantially adversely affecting the integrity of the molded article.

4,174,230

GYPSUM COMPOSITIONS

Mitsuo Hashimoto, Ichihara; Toshiyuki Takyu, Sodegaura; Masaru Inoue, Sodegaura; Masami Takasaki, Sodegaura, and Shinho Shiho, Sodegaura, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,870

Claims priority, application Japan, Apr. 16, 1977, 52/43712

Int. Cl.[2] **C04B** *11/09*

U.S. Cl. 106—109 **13 Claims**

1. An improved gypsum composition comprising (a) gypsum particles and (b) at least one binder for gypsum particles, the improvement comprising

said gypsum particles being light-weight spherical gypsum formed of intertwined short gypsum fibers and having a bulk density of from 0.05 to 0.5 g/cm^3.

4,174,231

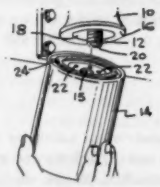
METHOD FOR FLUSHING THE CRANKCASE OF AN INTERNAL COMBUSTION ENGINE

Harold G. Hobgood, 620 Spruce St., Newport News, Va. 23601

Filed Sep. 8, 1977, Ser. No. 831,685

Int. Cl.[2] **B08B** *3/08*

U.S. Cl. 134—10 **1 Claim**



1. A method of flushing with a liquid the crankcase of an internal combustion engine of the type having a spin-on oil filter cartridge fitting including an outflow opening, an inflow opening and a threaded pipe portion on which a spin-on oil filter cartridge is removably mounted, said method comprising the steps of draining the engine crankcase of any fluids contained therein, removing said spin-on filter cartridge, placing said flushing liquid in the crankcase, operating the engine to effect circulation of the flushing liquid in the engine to cause flow of the flushing liquid from said outflow opening and immediately returning said flushing liquid flowing from the outflow opening to the inflow opening of said engine without passing said flushing liquid through filtration means.

4,174,232

METHOD OF MANUFACTURING SHEETS, STRIPS AND FOILS FROM AGE HARDENABLE ALUMINUM ALLOYS OF THE Al-Si-Mg-TYPE

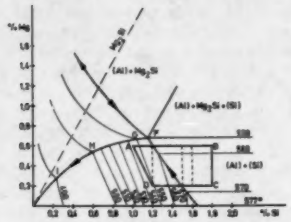
Dieter Lenz, and Erich Trägner, both of Singen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 22, 1977, Ser. No. 863,174

Claims priority, application Switzerland, Dec. 24, 1976, 16299/76

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 24 Claims



1. A process for fabricating high strength, improved formability, low earing aluminum strip, sheet and foil from age hardenable aluminum alloys of the Al-Si-Mg type, comprising:

(A) forming an aluminum alloy melt composition consisting essentially of from about 1.0 to 1.8 weight percent silicon, from about 0.2 to 0.6 weight percent magnesium, and the balance essentially aluminum;

(B) casting said alloy in strip form;

(C) hot rolling said cast strip to a first thickness;

(D) cold rolling said hot rolled strip to an intermediate thickness; and

(E) annealing said cold rolled strip of intermediate thickness at a temperature of from about 450° C. to about 550° C. so as to provide an aluminum alloy matrix characterized by undissolved, finely dispersed silicon particles whose size is in the lower zone of the wavelengths of visible light so as to obtain good deformability and strong age hardening characteristics.

4,174,233

EXPANSION PROCESS FOR REDUCING THE STRESSES IN A SEAMLESS METAL TUBE

Alain Vignes, Paris, France, assignor to Societe Franceo-Americaine de Constructions Atomiques-Framatome, Courbevoie, France

Filed Sep. 22, 1977, Ser. No. 835,853

Claims priority, application France, Oct. 1, 1976, 76 29655

Int. Cl.[2] C23F *7/00*

U.S. Cl. 148—4 4 Claims

1. A process for reducing the longitudinal residue stresses to a negligible amount and the circumferential residual stresses to approximately half their original values in a seamless cold-worked metal tube which has undergone a straightening operation, the process comprising, while maintaining said tube at a temperature close to ambient temperature, subjecting said tube for a period of at least 3 minutes, to an internal pressure of between 0.8 Pc and 1.0 Pc, Pc being the critical pressure beyond which said tube undergoes a plastic deformation over its entire thickness whereby the tube remains substantially undeformed after treatment.

4,174,234

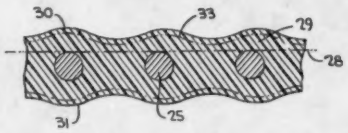
SILICON-IMPREGNATED FORAMINOUS SHEET

Joseph Lindmayer, Bethesda, Md., assignor to Semix, Incorporated, Rockville, Md.

Division of Ser. No. 895,814, Apr. 12, 1978. This application Oct. 10, 1978, Ser. No. 950,044

Int. Cl.[2] H01L *27/14, 21/208, 21/84*

U.S. Cl. 148—33 7 Claims



1. A body of cooled, formerly molten silicon suitable for use in making photovoltaic cells, comprising as an inner zone, a foraminous sheet of carrier material capable of maintaining its structural integrity in the presence of molten silicon, the foramina of said sheet being filled with solidified silicon, and a surface zone of silicon overlying said inner zone, said surface zone being substantially free of said carrier material and having a depth of at least about ten microns.

4,174,235

PRODUCT AND METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL EMPLOYING ANTIMONY

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,987

Int. Cl.[2] H01F *1/04;* C22C *38/02*

U.S. Cl. 148—111 11 Claims

1. A cold-rolled silicon-iron sheet product consisting essentially of (i) silicon in an amount from about 2.2 to about 4.5 percent, (ii) boron in an amount from about 3 to about 35 parts per million, (iii) nitrogen in an amount from about 30 to about 100 parts per million and in a ratio to boron of from about one to about 15 parts per part of boron, (iv) manganese in an amount from about 0.02 to about 0.05 percent, (v) sulfur in an amount from about 0.005 to about 0.025 percent, and (vi) antimony in an amount from about 0.01 to about 0.10 percent, said amount of sulfur including an amount thereof which is not combined, the balance iron.

4,174,236

METHODS OF AND APPARATUS FOR CONTROLLING CAPACITANCE UNBALANCE-TO-GROUND IN CABLES

Timothy S. Dougherty, Roswell, and William M. Flegal, Tucker, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,362

Int. Cl.[2] B29D *27/00;* B29F *3/10*

U.S. Cl. 156—51 8 Claims

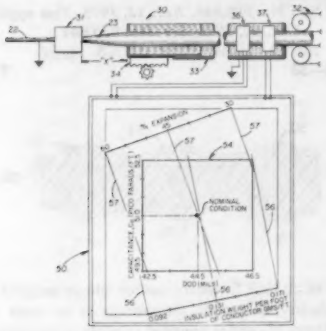
1. A method of controlling capacitance unbalance-to-ground between conductors, which comprises the steps of:

covering individual conductors with a plastic insulating material to form insulated conductors;

measuring coaxial capacitance and outside diameter of each of the conductors;

generating electrical signals corresponding to the measured coaxial capacitance and outside diameter of each insulated conductor and relating these signals to capacitance unbalance-to-ground between each said conductor and a reference insulated conductor having preselected values of coaxial capacitance and outside diameter; and

controlling the process of covering of each conductor to maintain the capacitance unbalance-to-ground between



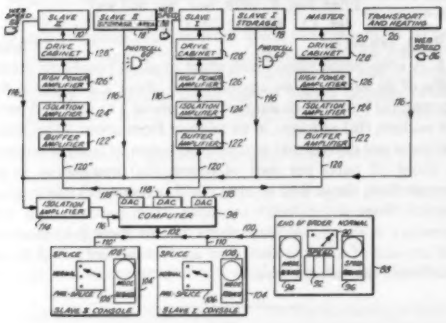
each said conductor and the reference conductor within a predetermined range of values.

4,174,237

PROCESS AND APPARATUS FOR CONTROLLING THE SPEED OF WEB FORMING EQUIPMENT

Frank E. Hemming, Jr., Washingtonville, N.Y., and Stuart A. Johnson, Denville, N.J., assignors to International Paper Company, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,834
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—64 **10 Claims**



1. An apparatus for processing web material comprising a master unit for processing web material having a first drive means, said first drive means capable of driving said master unit at any speed within a predetermined range of speeds, said master unit being selectively operable at any one of a plurality of predetermined modes and at a range of speeds within at least one of said modes, at least one slave unit for processing web material having a second drive means, said second drive means capable of driving said slave unit at any speed within a predetermined range of speeds, each slave unit being selectively operable at any one of a plurality of predetermined modes and at a range of speeds within at least one of said modes, web storage means communicating between each master and slave unit, speed sensing means communicating with said master unit, speed sensing means communicating with each of said slave units, sensing means associated with each of said web storage means, computer means (a) to calculate a signal corresponding to a speed selected for said master unit within said predetermined range of speeds, (b) to compute a speed for each of said slave units corresponding to the speed selected for said master unit and the mode selected for each of said slave units and to provide a signal corresponding to said computed speed, (c) to compute a corrected speed for each of said slave units and to provide a signal corresponding thereto whenever the quantity of web material in the web storage means associated with said slave unit decreases to a predetermined quantity, output interface means between said computer means and each of said first and second drive means including a digital to analog converter, an optical isolation amplifier and a power amplifier, computer input interface means to select the mode and speed for the said master unit and computer input interface means to select the mode of operation of each slave unit.

9. A process for controlling the speed of web processing equipment including a master unit having a first drive means capable of driving said master unit at any speed within a predetermined range of speeds, at least one slave unit having a second drive means and a web storage means communicating between each slave unit and said master unit comprising selecting a speed for said master unit within said predetermined speed range, converting said speed first into a derived number and second into a binary number, further converting said binary number to an analog equivalent direct current voltage referenced to earth ground, converting said equivalent direct current voltage to an equivalent direct current voltage isolated from earth ground by light amplification means and capable of having an alternating current voltage offset from earth ground, amplifying said isolated direct current voltage to a direct current control voltage corresponding to the speed selected for said master unit, applying said direct current control voltage to said master unit first drive means, calculating a speed for each slave unit in binary notation corresponding to the said selected speed for said master unit in binary notation, converting said slave unit speed in binary notation to an analog equivalent direct current voltage referenced to earth ground, converting said equivalent direct current voltage to an equivalent direct current voltage isolated from earth ground by light amplification means and capable of having an alternating current voltage offset from earth ground, amplifying said isolated direct current voltage to a direct current control voltage corresponding to the speed calculated for said slave unit, applying said direct current control voltage to said slave unit second drive means, measuring the speed of the web material passing through said master unit, comparing the measured speed with the speed selected for said master unit, calculating a first error signal corresponding to the difference between said measured speed and said selected speed, converting said first error signal into an isolated amplified direct current control voltage to correct the speed of said master unit, measuring the speed of the web material passing through said slave unit, comparing the measured speed with the speed calculated for said slave unit, calculating a second error signal corresponding to the difference between said measured speed and said calculated speed and converting said second error signal into an isolated amplified direct current control voltage to correct the speed of said slave unit.

4,174,238

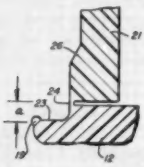
HERMETICALLY SEALED TAMPERPROOF PORT PROTECTOR AND METHOD OF MAKING FRANGIBLE SEAL

Thomas A. Fowles, McHenry, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 777,753, Mar. 14, 1977, Pat. No. 4,127,208.
This application Jan. 25, 1978, Ser. No. 872,287
Int. Cl.[2] B29C *27/00*
U.S. Cl. 156—69 **3 Claims**

1. An improved method of forming a fracturable seal of the type wherein a thermoplastic cup-shaped closure is sealed to a thermoplastic planar surface, said cup-shaped closure being formed with a radially outwardly extending sealing portion, said method comprising the steps of assembling the closure on the planar surface with said portion seated on said surface; heating a sealing die above the melting temperature of the thermoplastic material of the closure and surface; bringing said

sealing die toward and against said portion; and pressing said sealing die into said portion and said surface to depress said surface at least 0.005 inch from its original height by the sealing action of the die and to displace said portion material into a



bead outwardly and form a fracturable seal normal to the plane of said surface, whereby said seal will be fractured in a plane substantially parallel to said surface thereafter due to tension stress when the closure is removed from the planar surface.

4,174,239

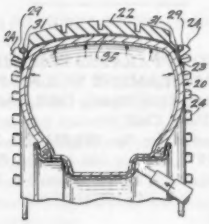
METHOD AND APPARATUS FOR RETREADING TIRES

Russell Symmes, P.O. Box 621, Muncie, Ind. 47305

Continuation-in-part of Ser. No. 697,859, Jun. 21, 1976, abandoned. This application Mar. 3, 1978, Ser. No. 883,212

Int. Cl.[2] **B29H** *5/30*

U.S. Cl. 156—96 **2 Claims**



1. Apparatus for the retreading of a worn and prepared tire carcass comprising a precured tread stock strip for application to the circumference of said carcass, said strip including a central wear tread area and wings extending from each side thereof, upstanding means on said wing forming a circumferential groove on each side of said wear tread area, a layer of unvulcanized cushion gum underlying only said wear tread area and stopping laterally short of said wings, and rings having a predetermined substantially fixed circumferential dimension and received in said circumferential grooves, the circumference of said rings being small enough to exert a high pressure on said tread stock during curing of said cushion gum layer, whereby the edge areas of said wear tread are held with high pressure against said tire carcass, said wing areas and lugs being trimmed away after curing of said cushion gum layer leaving said wear tread area fixed to said carcass.

4,174,240

NOVEL TRANSPARENT POLYURETHANE POLYUREAS FOR LAMINATION OF GLAZING MATERIALS

Hanns P. Müller, Leverkusen; Wolfgang Oberkirch, Cologne; Kuno Wagner, and Bernd Quiring, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 833,311, Sep. 14, 1977, Pat. No. 4,139,674. This application Sep. 29, 1978, Ser. No. 947,222

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644434

Int. Cl.[2] **C03C** *27/04;* **B32B** *27/40;* **C08G** *18/32;* **C09J** *5/04*

U.S. Cl. 156—99 **2 Claims**

1. A process for the production of laminates, wherein sheets of silicate glass and/or transparent glass-like plastics are coated and/or bonded together with a transparent film of 0.1 to 5 mm. in thickness formed from a polyurethane polyurea with a predominantly linear molecular structure exclusively containing aliphatically or cycloaliphatically bound urethane and urea segments and having a shear modulus G' (DIN 53 445) which amounts to between 2 and 140 N/mm^2 at 20° C. and does not fall below a value of 1 N/mm^2 at 60° C., characterized by

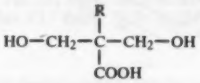
(a) a content of urea groups —NH—CO—NH— amounting to between 1 and 20% by weight and

(b) a content of lateral carboxyl groups —COOH directly attached to the main chain of the molecule amounting to between 0.001 and 10% by weight.

2. A process for the production of laminates of glass or glass like transparent plastics with polyurethane polyurea comprising subjecting a transparent film of 0.1 to 5 mm in thickness formed from a polyurethane polyurea comprising the reaction product of

(a) dihydroxy compounds having molecular weights between about 300 and 6,000 selected from the group consisting of polyesters and polyethers,

(b) dihydroxy carboxylic acids corresponding to the formula



wherein R represents H, or a C_1 to C_4 alkyl radical,

(c) optionally aliphatic or cycloaliphatic diols having molecular weights of between about 62 and 300,

(d) diisocyanates having exclusively aliphatically and cycloaliphatically bound isocyanate groups, and

(e) organic diamines containing aliphatically and cycloaliphatically bound primary amino groups and having molecular weights between about 60 and 3,000, wherein the equivalent ratio of d:(a+b+c) is between about 1.1:1 and 4:1, the equivalent ratio of e:(a+b+c) is between about 0.1:1 and 3:1, the molar ratio of a:b is between about 1:0.01 and 1:12, and the molar ratio of a:c is between about 1:0 and 1:10, said polyurethane polyurea having

(1) a molecular weight greater than about 10,000,

(2) a urea group content of between about 1 and 20 wt. %, and

(3) a content of lateral carboxyl groups directly attached to the main chain of the molecule of between about 0.001 and 10 wt. %

and at least one immediately adjacent sheet of a glass or glass like plastic to heat and pressure.

4,174,241

SIMULTANEOUSLY LAMINATING AND PRESS POLISHING PLASTIC LAMINATED TRANSPARENCIES

Paul A. Rockar, Cabot; Melvin K. Law, and Thomas W. Hawk, both of New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

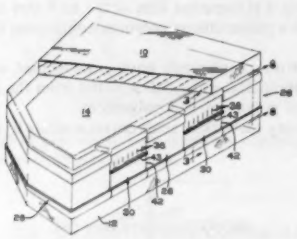
Filed Jul. 21, 1978, Ser. No. 926,685

Int. Cl.[2] **B32B** *31/20*

U.S. Cl. 156—102 **10 Claims**

1. A method of fabricating a laminated transparency having smooth outer major surfaces and provided with a minimum of entrapped fluid bubbles comprising assembling alternate layers of a relatively hard plastic selected from the group of hard transparent plastic materials consisting of acrylic plastics, polycarbonates, polyesters, and hard polyurethanes and of a relatively soft interlayer material selected from the group consisting of polyurethanes, silicones, ionomers, and plasticized polyvinyl acetals to form an assembly to be laminated and simultaneously press polished, enclosing the outer major surfaces of said assembly between a pair of pressing plates having a greater extent than the outline of said layers in such a

manner that the pressing plates extend beyond the margins of said layers to form a marginal space, applying marginal frame means having a thickness approximating the total thickness of said layers between the extending portions of said pressing plates along at least two adjacent sides of said marginal space and between the extending portions of said pressing plates along at least a portion of the length of at least one of the remaining sides of said marginal space, applying between at least a portion of the remainder of said extending portions of said pressing plates along at least one of said remaining sides of said marginal space, wedge means having a thickness greater than the total thickness of said layers and composed of material softer than said relatively hard plastic to form a wedge-shaped



space between one of said pressing plates and an outer major surface of one of said layers of said assembly that faces said one of said pressing plates, inserting said assembly of said layers so arranged between said pressing plates within a thin, flexible laminating bag with said marginal frame means and said wedge means therearound, evacuating said laminating bag, sealing said evacuated laminating bag, and exposing said sealed, evacuated laminating bag to an elevated pressure and temperature for sufficient time for the pressing plates to press polish the outer major surfaces of said assembly, to distort the wedge means until the thickness thereof approximates the total thickness of said assembly and to laminate the layers of said assembly.

4,174,242

TIME DELAY BEFORE POST CURE INFLATION

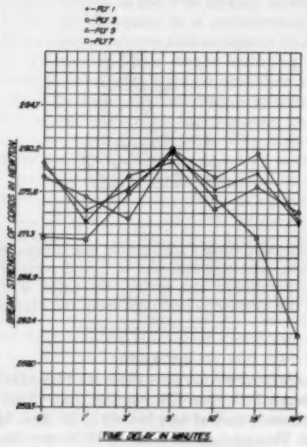
Myron T. Ayers, and William J. Corsaut, both of Akron, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 770,962, Feb. 22, 1977, abandoned. This application Oct. 11, 1978, Ser. No. 950,505

Int. Cl.[2] B29H *5/00*

U.S. Cl. 156—110 R **2 Claims**

1. In a method of curing a nylon cord tire under heat and pressure in a mold, then post inflating the tire outside of the mold to a pressure of at least 170 kilopascals before the tire cools below the heat shrink temperature of the nylon cord, the improvement which comprises a delay of from 4 to 7 minutes



between the time of removal of the tire from the mold and the time the tire is post inflated.

4,174,243

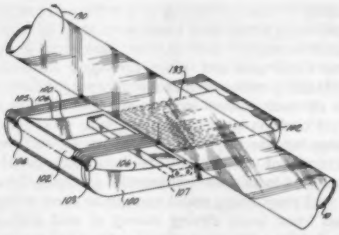
METHOD AND APPARATUS FOR WIPING RESIN FROM FILAMENT WOUND PIPE

Gerald M. Magarian, Long Beach, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 818,952, Jul. 25, 1977, Ser. No. 824,494, Aug. 15, 1977, and Ser. No. 842,624, Oct. 17, 1977. This application Oct. 17, 1977, Ser. No. 842,548

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—175 **23 Claims**



1. In a method for manufacturing plastic pipe reinforced with fibrous rovings comprising the steps of coating the rovings with a fluid resin, and winding a rotating mandrel with the resin coated rovings, the improvement which comprises the step of contacting the wound rovings with at least one filament segment curved around a portion of the wound pipe, and moving the filament segment longitudinally along the mandrel during the winding as the mandrel is rotated to wipe resin from the wound rovings to leave a substantially uniform surface layer of resin on the rovings, the layer being sufficiently thin that it stays on the rovings while the mandrel is rotating, whereby resin is prevented from being slung from the pipe as it is formed.

11. In apparatus for making plastic pipe reinforced with helical layers of fibrous roving, and which apparatus includes a rotating mandrel upon which the pipe is formed, means for applying liquid resin to the rovings, and a carriage for carrying the rovings to and from along the length of the mandrel as the

resin coated rovings are helically wound on the mandrel, the improvement comprising:

(a) at least two elongated, spaced-apart supporting members, each supporting member having a plurality of circumferential longitudinally spaced grooves;

(b) a plurality of substantially parallel, spaced-apart filament segments positioned in the grooves; and

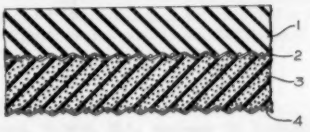
(c) means for holding the filaments in contact with rovings wound on the pipe to wipe resin from the rovings.

4,174,244

METHOD OF MAKING A PRINTING BLANKET

Eric W. Thomas, and Thomas J. Maistros, both of Stow, Ohio, assignors to Industrial Electronic Rubber Company, Twinsburg, Ohio

Continuation of Ser. No. 690,856, May 28, 1976, abandoned.
This application Aug. 1, 1977, Ser. No. 820,845
Int. Cl.[2] B29C *3/00*
U.S. Cl. 156—242 **12 Claims**



1. A process for preparing a printing blanket useful for offset printing which comprises

(a) preparing a composite by

(1) sheeting out a layer of a foamable and cross-linkable elastomeric material over a fibrous or pressure sensitive adhesive backing material,

(2) applying an intermediate layer of fibrous material over a layer of foamable material, and

(3) sheeting out a top layer of a non-foamable cross-linkable elastomeric material over said intermediate layer of fibrous material, and

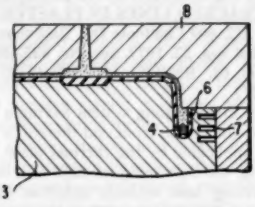
(b) molding the composite at an elevated temperature under pressure whereby both layers of elastomeric material are cross-linked in situ and the foamable elastomeric material is foamed in situ.

4,174,245

METHOD OF FABRICATING A FLEXIBLE FUEL TANK

Philippe M. Martineau, Nantes, France, assignor to Regie Nationale des Usines Renault, Billancourt, France

Filed Feb. 24, 1978, Ser. No. 881,125
Claims priority, application France, Feb. 24, 1977, 77 05423
Int. Cl.[2] B32B *1/02*
U.S. Cl. 156—245 **11 Claims**



1. A method of fabricating a flexible fuel tank comprising:

injecting firstly an elastomer into a mold through an elastomer inlet, the mold having a lower element and an upper stand element, said element defining a first half-shell with a peripheral edge;

cooling the peripheral edge of the injected elastomer to a temperature below that which would produce complete vulcanization of the injected elastomer;

vulcanizing in situ the injected elastomer, except for the cooled peripheral edge thereof;

replacing the mold upper stamp element with a second correspondingly shaped stamp element, the second upper stamp element and the lower element defining a second half-shell also having a peripheral edge, the mold formed by said second stamp element having a larger volume than that of the mold produced by said first stamp element;

halting the cooling of the peripheral edge;

injecting secondly an elastomer between the second stamp element and the previously injected elastomer; and,

vulcanizing in situ the secondly injected elastomer and the peripheral edge of the firstly injected elastomer;

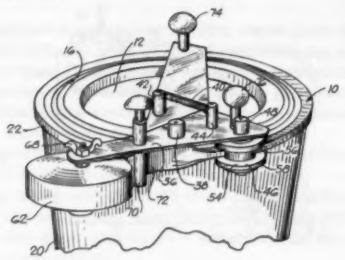
whereby first and second vulcanized elastomer half-shells are formed and joined at the commonly vulcanized peripheral edges of each half-shell.

4,174,246

HAND TAPING DEVICE

George D. Ralston, Bridgeview, Ill., assignor to Natico, Inc., Chicago, Ill.

Filed Jul. 25, 1977, Ser. No. 818,540
Int. Cl.[2] B65B *7/28, 51/06*
U.S. Cl. 156—391 **3 Claims**



1. A device for taping a cover onto a drum comprising a base plate and means mounting the base plate on the cover for rotational movement on an axis corresponding to the axis of the cover, an arm pivotally mounted on the base plate for rocking movement relative to the base plate, a pressure roller mounted on the arm for free rotational movement, a tape supply roll support mounted on the arm for free rotational movement of a supply roll, a guide post fixed to the arm intermediate the support and the pressure roller and offset inwardly towards the periphery of the cover from a line between the axes of said support and pressure roller so that the tape comes into engagement with the guide post during passage from the supply roll to the pressure roller, and means constantly urging the arm for rocking movement about its pivot in a direction to displace the pressure roller inwardly towards the periphery of the cover, in which the guide post depends from the arms and in which the lower end portion of the guide post is formed with an outward flare to preform the tape as it is drawn thereover.

2. A device for taping a cover onto a drum comprising a base plate and means mounting the base plate on the cover for rotational movement on an axis corresponding to the axis of the cover, an arm pivotally mounted on the base plate for rocking movement relative to the base plate, a pressure roller mounted on the arm for free rotational movement, a tape supply roll support mounted on the arm for free rotational movement of a supply roll, a guide post fixed to the arm intermediate the support and the pressure roller and offset inwardly towards the periphery of the cover from a line between the axes of said suppport and pressure roller so that the tape comes into engagement with the guide post during passage from the supply roll to the pressure roller, means constantly urging the

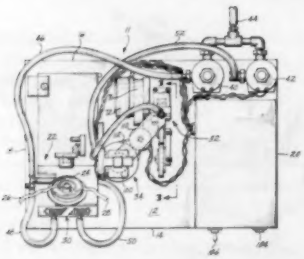
arm for rocking movement about its pivot in a direction to displace the pressure roller inwardly towards the periphery of the cover and means for cutting the tape, in which the cutting means is incorporated in the guide post and comprises a guide post in the form of a hollow sleeve section, a rod mounted for axial movement in the sleeve section between raised and lowered positions of adjustment with a portion of the rod extending above the sleeve section, a knife extending outwardly from the rod through an elongate slot in the sleeve section, means constantly urging the rod towards raised position whereby the knife is out of alignment with the portion of the rod engaged by the tape, and means for actuating the rod from raised to lowered position to sever the portion of the tape in engagement with the post.

4,174,247

APPARATUS FOR SPLICING THE ENDS OF MAGNETIC TAPE WOUND ON SPOOLS OF THE TYPE USED IN ENDLESS TAPE CARTRIDGES

Arthur Dyck, Burnaby, Canada, assignor to International Audio Visual, Inc., Glenview, Ill.

Filed Nov. 25, 1977, Ser. No. 854,767
Int. Cl.[2] B31F *5/00*; B32B *31/00*
U.S. Cl. 156—506 **19 Claims**



1. A splicing apparatus for joining the ends of a magnetic tape wound on spools of the type used in endless tape cartridges in which an endless tape is withdrawn from the innermost on the spool and returned to the spool as the outermost winding, comprising:

splicing tape supply means for supplying a continuous length of splicing tape of the type having a contact adhesive on one surface and haing a foil-like thickness dimension selected to insure that a splice formed thereby on the magnetic tape moves smoothly past all points in the tape path of the endless tape cartridge;

cutting means including a cutting blade, a coacting cutting surface, and means for lengthwise advancement of the splicing tape so that the adhesive surface thereof is moved into contact with and adherence to said cutting surface, and means for controllably advancing said cutting surface and the splicing tape adhering thereto passed said blade and for actuating said blade to sever the splicing tape into individual splicing segments which are retained on said cutting surface by the contact adhesive of the splicing tape;

magnetic tape holding means mounted in fixed, spaced relation to said cutting means for holding opposed ends of a spool of tape in end to end abutment; and

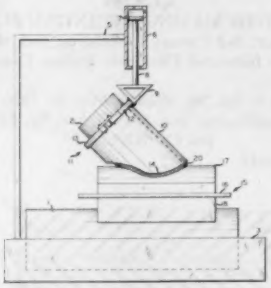
vacuum pickup means mounted for movement between said cutting means and said magnetic tape holding means, and including means for picking up one of said splicing segments off of said cutting surface and transporting said segment to said magnetic tape holding means and placing said segment in splicing position with the adhesive surface in overlapping contact with surfaces of the tape adjacent the abutting end.

4,174,248

PROCESS AND APPARATUS FOR CONNECTING PLASTIC PIPES

James C. Carroll, Hopkinsville, Ky., and Clel H. Shafer, Perryton, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 621,887, Oct. 14, 1975, abandoned. This application Oct. 24, 1978, Ser. No. 954,157
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—538 **6 Claims**



1. Apparatus for connecting a lateral pipe to a main pipe comprising

a. first pipe holding means to hold said main pipe,

b. second pipe holding means to hold said lateral pipe, said second pipe holding means consisting essentially of

aa. a guiding sleeve having an inner configuration essentially equal to the outer configuration of said lateral pipe, one end of said guiding sleeve having essentially the configuration of the outer surface of the main pipe, the internal diameter (d) of said guiding sleeve being related to the external diameter (D) of said main pipe by the following inequality:

$$\frac{1}{2} \leq d/D \leq 1,$$

bb. means contacting the exterior surface of the lateral pipe to hold said lateral pipe in position in said guiding sleeve,

c. motion means connecting said first pipe holding means and said second pipe holding means for applying a relative motion between said second pipe holding means and said first pipe holding means so that said lateral pipe and said main pipe can be brought into contact with each other in the desired relative position, in which said one end of said guiding sleeve approximately fits on said main pipe.

4,174,249

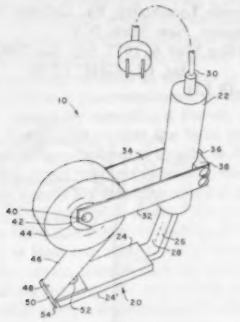
SYSTEM FOR INSTANTANEOUS SEALING OF CRACKED LINES IN PLASTER

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Sep. 22, 1977, Ser. No. 835,458
Int. Cl.[2] B30B *15/34*; B32B *31/20*
U.S. Cl. 156—577 **2 Claims**

1. In a plaster crack sealing system having a thermal plate with a guide proximate the front end thereof, a handle, and a supply of tape applicable by the thermal plate, the improvement comprising: the tape being metallic foil, one face of the metallic foil having heat sealable adhesive thereon, means holding the tape coiled and spaced from the thermal plate with a free end thereof leading forwardly through the guide and rearwardly past the thermal plate, the handle providing an outwardly angled grip relative to the thermal plate, the means holding the tape including a pair of arms and a spool having means for mounting on the arms, the arms extending forwardly from the handle a distance proportioned for holding the spool rearwardly clear of the forward end of the thermal plate providing for obstruction free maneuvering and visual access in

operation of the system, the guide having a slot proximate the forward end of the thermal plate, and having a portion angled



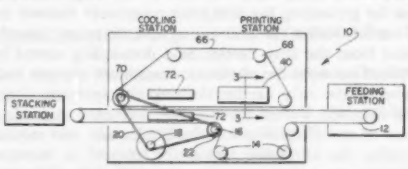
over the forward end of the thermal plate and slightly to the rear leaving space only sufficient for the metallic foil to pass freely between the angled portion and the thermal plate.

4,174,250

APPARATUS FOR SUBLIMATION IMPRINTING TILES

David Durand, Bristol, R.I., assignor to Freeman Transfer Printing Company, Inc., East Providence, R.I.

Filed Apr. 10, 1978, Ser. No. 895,229
Int. Cl.[2] B30B *15/34, 5/02*
U.S. Cl. 156—583.3 **2 Claims**



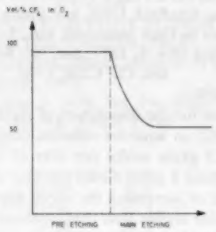
1. Apparatus for transferring a design imprinted on a transfer sheet in dyes which are sublimatible at a predetermined temperature to an article having a plastic resin upper surface capable of receiving said dyes, comprising a platen having a heat conductive press member, means for receiving and moving said article so as to place said upper surface and said press member in opposed position to each other, means for disposing the transfer sheet between said article and said press member, means for moving said press member toward said article so as to force said sheet into direct contact with said article upper suface, and means for heating the platen so as to raise the temperature of said sheet and said article surface to said predetermined temperature so as to sublimate said design into said surface, said press member including a mass of heat conductive liquid metal restrained within a recess in said platen, and a flexible membrane spanning said recess, said membrane adapted to contact said sheet, said platen forming a part of a heat activated printing station, a cooling station positioned adjacent said printing station for cooling said article after being heated in said printing station, said means for receiving and moving said article being a flexible endless belt movable between said printing and cooling station, said belt including an article carrier mounted thereon, said carrier having nest means for supporting a plurality of said articles and means for indexing said carrier into registry with said platen, said belt being wider than said carrier whereby edge portions of said belt are uncovered adjacent said carrier, said transfer sheet being dimensioned so as to cover said carrier and said edge portions, and a pair of second belts engaging the edge portions of said first belt so as to maintain said transfer sheet clamped between said first and second belts and hence in proper registry with said carrier.

4,174,251

METHOD OF SELECTIVE GAS ETCHING ON A SILICON NITRIDE LAYER

Klaus Paschke, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,446
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658448
Int. Cl.[2] H01L *21/306;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **4 Claims**



1. A method of gas etching a silicon nitride layer deposited on a semiconductor body of silicon by immercing said semiconductor body having said silicon nitride layer thereon in a plasma produced by way of high frequency glow discharge of a glass atmosphere containing carbon tetrafluoride and oxygen, the improvement comprising:

etching in a first stage at a first oxygen concentration and at a first high frequency power range; and

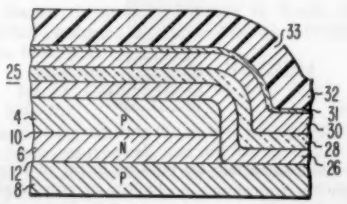
etching in a second stage at a second oxygen concentration and at a second high frequency power range, wherein the first oxygen concentration is lower than the second oxygen concentration.

4,174,252

METHOD OF DEFINING CONTACT OPENINGS IN INSULATING LAYERS ON SEMICONDUCTOR DEVICES WITHOUT THE FORMATION OF UNDESIRABLE PINHOLES

Henry Kressel, Elizabeth, and Mark A. Spak, Edison, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1978, Ser. No. 928,310
Int. Cl.[2] H01L *21/285, 21/306, 21/314*
U.S. Cl. 156—653 **9 Claims**



1. In a method of defining a contact opening to a semiconductor device having one or more passivating layers thereon whereby an inert layer is applied over said passivating layer, a layer of photoresist is applied over said inert layer, said photoresist exposed to a light pattern, developed to leave openings in the photoresist layer where the desired contact openings are to be formed, and the device contacted with one or more etchant solutions to propagate said openings through the inert and

passivating layers to the substrate, the improvement which comprises

applying as the inert layer a layer of undoped polycrystalline or amorphous silicon and employing an etchant solution for etching said inert layer which etches large diameter openings faster than small diameter openings such that small diameter openings in the photoresist layer are not propagated through said inert layer.

4,174,253

DISSOLUTION OF METALS UTILIZING A H_2O_2-H_2SO_4 SOLUTION CATALYZED WITH HYDROXY SUBSTITUTED CYCLOPARAFFINS

Moenes L. Elias, Canfield, Ohio, and Philip D. Readio, Sparta, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 8, 1977, Ser. No. 849,575

Int. Cl.[2] C23F *1/00*

U.S. Cl. 156—666 **23 Claims**

1. In a process for the dissolution of metal in which a metal is contacted with an aqueous solution containing from about 0.2 to about 4.5 gram moles per liter of sulfuric acid, from about 0.25 to about 8 gram moles per liter of hydrogen peroxide, the method of increasing the metal dissolution rate of the solution to a value higher than that obtained by such a solution free of any chloride and bromide ions, which method comprises adding at least about 0.085 and up to 0.5 gram moles per liter of the solution of a promoter selected from:

(a) monohydroxy or dihydroxy-substituted cycloparaffins containing from 5 to 7 carbon atoms in the ring structure, or

(b) monohydroxy or dihydroxy-substituted alkylcycloparaffins containing from 5 to 7 carbon atoms in the ring structure, where each of the alkyl groups contains from 1 to 4 carbon atoms and is attached to an unsubstituted carbon atom in the ring structure.

4,174,254

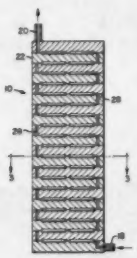
COMPRESSION HUB

Albert L. Gaines, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 12, 1977, Ser. No. 832,492

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—2 **6 Claims**



1. A compression hub for bucking forces of magnets in a fusion reactor comprising: a plurality of polygonal metallic pancakes arranged in stacked relationship; said pancakes sealed to one another at the perimeter thereof, and spaced from one another within the seal welded area, thereby forming flow chambers between adjacent pancakes; at least one vertical opening through each of said pancakes in fluid communication with the flow chambers above and below the respective pancake; and the vertical openings through adjacent pancakes being remote from one another, whereby coolant flowing from one opening to another passes through the flow chamber intermediate the adjacent pancakes.

4,174,255

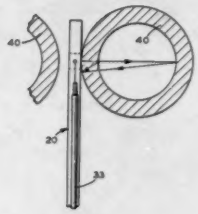
APPARATUS FOR LOCATING DEFECTIVE NUCLEAR FUEL ELEMENTS

William E. Lawrie, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,508

Int. Cl.[2] G21C *17/00*

U.S. Cl. 176—19 LD **14 Claims**



1. An ultrasonic search unit for testing nuclear fuel elements to detect the presence of water in fuel elements spaced within a fuel assembly of the type used in a water cooled nuclear reactor comprising a strip carrier with mutually opposing faces, the strip carrier being dimensioned to freely traverse the spaces between the fuel elements and having an integral aperture, an ultrasonic transducer element, electrodes deposited on at least two sides of the transducer element, the ultrasonic transducer element disposed within the aperture with one of the electrodes being flush with one of the strip carrier faces, means for grounding the ultrasonic transducer element to the strip carrier, means for decoupling said ultrasonic transducer element from the strip carrier, said decoupling means being interposed between the ultrasonic transducer element and the surfaces of the strip carrier defining the aperture, damping means disposed within the aperture adjacent to a recessed portion of the ultrasonic transducer element, and means for energizing the ultrasonic transducer element to transmit an ultrasonic pulse transversely into the wall of the fuel element to be tested.

4,174,256

REACTOR BASED ON A MAGNETOHYDRODYNAMICALLY DRIVEN SUPERSONIC GAS VORTEX

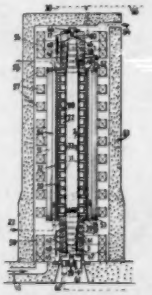
Jacob Kistemaker, Amsterdam, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Aug. 17, 1976, Ser. No. 715,201

Claims priority, application Netherlands, Oct. 29, 1975, 7512635

Int. Cl.[2] G21C *1/24*

U.S. Cl. 176—39 **3 Claims**



1. Apparatus for the stable confinement of a fast rotating

gaseous mixture of a heavy gas component and a light gas component comprising: an elongated reactor vessel constructed for nuclear fission reactions having a wall of circular cross section and end covers; means for cooling the reactor vessel; at least one supply pipe for supplying a gaseous mixture of heavy and light components to the interior of the vessel; means for imparting rapid rotation to the gas in the center of the vessel so that the heavy gas component, by means of a high pressure gradient caused by centrifugal forces, moves to the inside of the vessel wall and so that the light gas component forms a central gas column extending axially in the vessel, said means for imparting rapid rotation including means for ionizing the gas column, means for inducing an axial magnetic field extending the length of the vessel so that the gas in the vessel is subjected to the field, and means including at least one electrode mounted on at least one end cover of the reactor vessel in the center of the cover, from which an ionized column of light gas extends along the central rotation axis of the gas mass, for producing a radial electrical potential between the ionizing means and the vessel wall; means for flowing the heavy gas component in the form of a gas envelope axially along the vessel wall and then axially in an opposite direction; and supply and discharge pipes communicating with the ionized gas column, and a neutron reflector-moderator jacket mounted between the wall of the reactor vessel and the magnetic field-inducing means, said vessel wall being lined with electrode rings which are electrically insulated from each other, openings being provided in the inner surface of the wall of said reactor vessel which give access to annular cavities surrounded by cooling channels, said inner surface and the walls of the cavities being made of carbon or of a carbon compound.

4,174,257

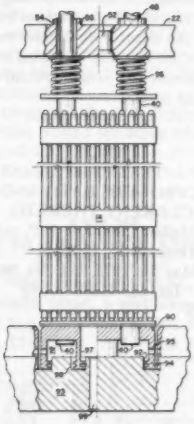
HYDRAULIC HOLD-DOWN FOR NUCLEAR REACTOR FUEL

John N. Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 784,189, Apr. 4, 1977. This application Jun. 1, 1978, Ser. No. 911,602

Int. Cl.[2] G21C *15/00*

U.S. Cl. 176—50 **2 Claims**



1. In a nuclear reactor having a pressure vessel and a core within the pressure vessel, said core comprised of a plurality of fuel assemblies each comprised of a plurality of vertically oriented fuel elements, the reactor having fluid under pressure passed upwardly over said fuel elements; the improvement comprising: a pressure plate attached to the lower end of a fuel assembly, and having an upper surface and a lower surface, said upper surface exposed to the fluid at the fuel assembly inlet; a sealing plate spaced below said pressure plate, portions of said seal plate peripherally engaged the outer portion of said pressure plate in closely spaced relationship for substantially restricting fluid flow therebetween, thereby forming a pressurizable plenum defined by the lower surface of said pressure plate and the upper surface of said seal plate; and a control rod guide tube extending vertically through said fuel assembly and said pressure plate, said control rod guide tube open to said pressure plenum at the lower end and open to the fluid flowing upwardly at the upper end of said fuel assemblies.

4,174,258

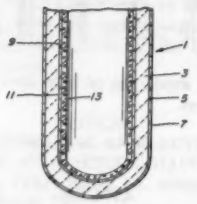
SOLID ELECTROLYTE OXYGEN SENSOR WITH ZERO OXYGEN REFERENCE

James D. Bode, Royal Oak, Mich., assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed May 3, 1978, Ser. No. 902,472

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **16 Claims**



1. An oxygen gas sensor element comprising a solid electrolyte body for transferring oxygen ions, the body having an outer surface having a conductive catalyst electrode thereon for contact with a gas, the oxygen content of which is to be measured, and an inner surface having a conductive electrode thereon, the improvement comprising:

protective means over the conductive electrode and the inner surface of the solid electrolyte body for protecting said inner surface from contact with oxygen-containing gases and providing a substantially zero oxygen reference for said inner surface.

4,174,259

ELECTROLYTIC CELL STRUCTURE AND METHOD OF ASSEMBLY

John T. Rucker, Lewiston, and Donald H. Porter, Kenmore, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

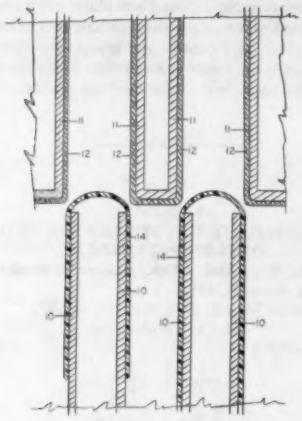
Filed Sep. 24, 1976, Ser. No. 726,312

Int. Cl.[2] C25B *13/02, 13/08, 9/00, 11/03*

U.S. Cl. 204—252 **11 Claims**

1. A method for reducing the anode-cathode gap in an electrolytic diaphragm-type cell, said cell having a cell container, anode and cathode elements disposed within said container, said cathodes equipped with deposited polymer reinforced hard asbestos diaphragms, a cell base for mounting said anodes, and a cell top, each of said anode elements comprising a pair of substantially parallel non-adjustable blades in a spaced-apart relationship, which method comprises detachably mounting at least one non-perforated preformed substantially U-shaped guide spacer over the top of each anode, said guide spacer partially enclosing both blades of said anode element during assembly, each leg of said spacer being of a thickness smaller than the desired cathode-anode gap, assembling the cathodes and anodes by inserting one over the other so that each anode

element is positioned between a pair of adjacent cathode elements with the guide spacers separating said elements to pro-



vide a cathode to anode gap of from about 5 millimeters to about 10 millimeters.

4,174,260

COMPOUND CELL FOR HIGH-TEMPERATURE ELECTROCHEMICAL REACTIONS

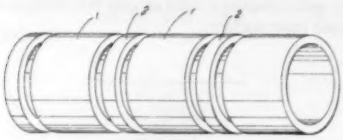
Rainer Schmidberger, Bermatingen, Fed. Rep. of Germany, assignor to Dornier Systems GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,364

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746172

Int. Cl.[2] C25B *9/00*; H01M *8/12*

U.S. Cl. 204—260 **5 Claims**



1. A compound cell for performing an electrochemical reaction at a temperature above 600° C. which comprises:

(a) a plurality of hollow, cylindrical bodies of a ceramic electrolyte capable of conducting oxygen ions and substantially impervious to gases;

(b) a plurality of rings of an electronically conductive material substantially impervious to gases, each of said bodies and each of said rings having an axis, two radially extending end faces, and inner and outer axially extending faces;

(c) gas-tight bonding means bonding the two end faces of each of said bodies in axial alignment to respective end faces of two axially adjacent rings, said bonding means, said bodies and said rings jointly constituting a self-supporting, gas-tight tube; and

(d) a pair of electrode layers associated with each of said bodies, one of said electrode layers being superimposed on the inner axial face of the associated body and conductively engaging one of the two adjacent rings in said tube, the other electrode layer being superimposed on the outer axial face of the associated body and conductively engaging the other adjacent ring outside said tube.

4,174,261

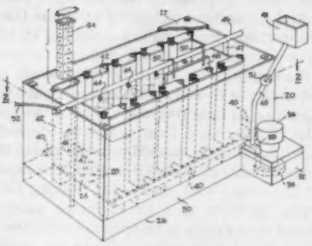
APPARATUS FOR ELECTROPLATING, DEPLATING OR ETCHING

Peter P. Pellegrino, 2642 W. Mendoza, Mesa, Ariz. 85202

Continuation-in-part of Ser. No. 705,827, Jul. 16, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,744

Int. Cl.[2] C25D *17/00*; C25F *7/00*

U.S. Cl. 204—273 **28 Claims**



1. Electroplating apparatus comprising:

a container for confining an electrolyte, said container having a sump adjacent the bottom thereof for maintaining a quantity of electrolyte,

first electrode means for supporting an article to be plated above the electrolyte level in said container, said first electrode means having means for electrically coupling an article to be plated to one terminal of a power supply,

manifold means adjacent said first electrode means for receiving electrolyte under pressure, said manifold means having spray means for receiving electrolyte from within said manifold means and for spraying electrolyte from a position above the electrolyte level in said container toward an article to be plated supported on said first electrode means above the electrolyte level in said container,

said manifold means including at least one removable cap, said second electrode means comprising at least one electrode member of a metal electrode which is substantially nonreactive in the electrolyte for the metal to be plated,

whereby pieces of the metal to be plated may be placed into said manifold means and into electrical contact with said second electrode means.

4,174,262

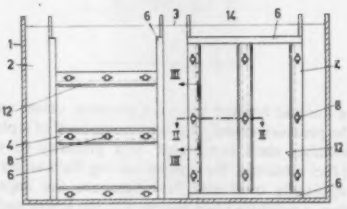
DEVICE FOR FASTENING AT LEAST ONE PLATE INSIDE AN ELECTROLYTE BATH AND FOR FEEDING CURRENT THERETO

Jozef K. E. H. van Mellaert, and Luc J. P. van Mellaert, both of Paalseweg, 51a, Tessenderlo, Belgium

Filed May 24, 1978, Ser. No. 909,004

Int. Cl.[2] C25D *17/08*

U.S. Cl. 204—297 R **15 Claims**



1. A device for fastening at least one plate inside an electrolyte bath and for feeding current thereto, for depositing a coating on the plate, comprising:

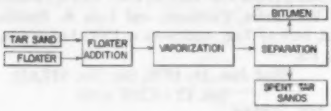
at least two parallel electrically insulated battens;
at least one electrical conductor embedded in one of said battens, and having means for connecting it to an electric current source;
electrically conductive contact means for providing electrical connection between said conductor and the plate, comprising a plurality of electrically conductive projections extending from said conductor, through the electrically insulated batten transversely of the batten, and outwardly from said one batten toward the other of said battens for engaging a plate placed between said battens; and
fastener means electrically insulated from said conductor for clamping the plate between said battens and establishing electrical contact between said projections and the plate.

4,174,263

RECOVERY OF BITUMEN FROM TAR SANDS

Franklin Veatch, Cleveland, and Harvey E. Alford, Amherst, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 528,062, Nov. 29, 1974, abandoned. This application Jun. 28, 1978, Ser. No. 919,890
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **3 Claims**



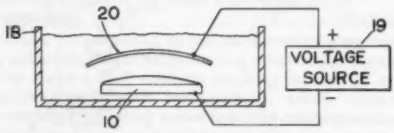
1. In a process for the recovery of bitumen from tar sands wherein bitumen is separated from the remainder of the tar sands by a floatation technique, the improvement comprising the steps of:
(a) contacting the tar sands with from 0.01 to 0.1 weight percent based on the weight of the tar sands of a liquid halogenated hydrocarbon that is able to at least partially penetrate the bitumen to form liquid treated tar sands;
(b) vaporizing at least some of the liquid halogenated hydrocarbon treated tar sands to produce a closed cell foam of the bitumen, whereby the vapor in the bitumen is entrapped, thereby reducing the density of the bitumen; and
(c) separating the bitumen from the remainder of the tar sands by floatation
whereby there is employed the step of mixing the liquid halogenated hydrocarbon treated tar sands with an aqueous alkaline solution to condition the tar sands prior to said floatation step.

4,174,264

TELEVISION SHADOW MASK AND METHOD OF MAKING SAME

John J. Frantzen, White Bear Lake, Minn., assignor to Neil B. Schulte, North Oaks, Minn., a part interest

Filed Aug. 11, 1978, Ser. No. 933,108
Int. Cl.[2] C25D *1/08*; H01J *29/80*
U.S. Cl. 204—11 **2 Claims**



1. A color television shadow mask constructed of electrodeposited metal formed on a base having a suitable resist pattern to produce a hole pattern, said hole pattern created by strips of metal between rows of holes and tie bars connecting said strips, said resist pattern comprising a layer of resist with openings therein to create exposed areas, said exposed areas comprising parallel bars with small elongated islands therebetween, said strips of the mask formed on the parallel bar areas and said tie bars formed on the elongated island areas.

4,174,265

BLACK CHROMIUM ELECTROPLATING PROCESS

Tomoya Minegishi, 4-9, 5-chome, Yachiyodai Kita, Yachiyo-shi, Chiba-ken, and Matsufumi Takaya, 663-88 Usuita, Sakura-shi, Chiba-ken, both of Japan

Continuation of Ser. No. 631,178, Nov. 11, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 827,963
Int. Cl.[2] C25D *3/04*
U.S. Cl. 204—51 **3 Claims**

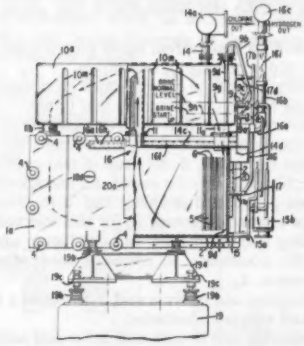
1. A black chromium electroplating process comprising immersing an anode and a cathode of electrically conductive material to be plated in a plating bath comprising 70 to 1000 g of dissolved chromium trioxide per liter and a radioactive substance selected from the group consisting of a hydroxide, halide, nitrate or acetate of thorium or uranium in an amount of 7×10^{-2} to 7×10^{-1} μCi per 100 parts by weight of chromium trioxide contained in the bath and passing a D.C. current between the anode and the cathode to plate the cathode with a black chromium coating.

4,174,266

METHOD OF OPERATING AN ELECTROLYTIC CELL HAVING AN ASBESTOS DIAPHRAGM

Thomas C. Jeffery, Lake Charles, La., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 744,309, Mar. 4, 1977, which is a continuation-in-part of Ser. No. 695,626, Jun. 14, 1976, which is a continuation-in-part of Ser. No. 577,270, May 14, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,633
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 **5 Claims**



1. The method of providing anolyte recirculation in a diaphragmtype electrolysis cell in which gas is evolved at the anode, which comprises operating the cell with a flooded anolyte compartment communicating with an overhead brine feed tank by at least one flooded vertical conduit leading from the top of the anolyte compartment to the top portion of said feed tank causing the anolyte to rise by the gas lift effect of the gas bubbles and to circulate upwardly along the diaphragm, and recirculating the liquid anolyte from the anolyte compartment through another flooded conduit leading from said feed tank to the anolyte compartment, adding diaphragm material to said circulating electrolyte, passing a portion of said electrolyte through the diaphragm and depositing a portion of the added diaphragm material on said diaphragm.

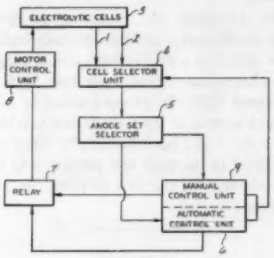
4,174,267
METHOD FOR DETECTING INCIPIENT SHORT CIRCUITS IN ELECTROLYTIC CELLS

Richard W. Ralston, Jr., Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 919,530, Jun. 27, 1978, Pat. No. 4,155,829, which is a continuation-in-part of Ser. No. 605,582, Aug. 18, 1975, Pat. No. 4,098,666, which is a continuation-in-part of Ser. No. 489,647, Jul. 18, 1974, Pat. No. 3,900,373, which is a continuation-in-part of Ser. No. 272,240, Jul. 17, 1972, abandoned. This application Feb. 22, 1979, Ser. No. 14,176

Int. Cl.[2] C25B *1/36, 15/04, 15/06*

U.S. Cl. 204—99 **9 Claims**



1. In a process for operating an electrolytic cell comprised of adjustable anodes, a group of at least three conductors electrically connected to said anodes, a liquid cathode, secondary conductors electrically connected to said liquid cathode, and an aqueous electrolyte between said liquid cathode and said anodes, wherein voltage is applied across said anodes and said liquid cathode to develop an electric current which passes sequentially through said conductors, said anodes, said electrolyte, said liquid cathode, and said secondary conductors, the improved process for detecting an incipient short circuit between said cathode and a specific said anode connected electrically to a specific said conductor in said group which comprises:

(a) obtaining a first current signal proportional to current in each said conductor in said group,

(b) obtaining a second current signal proportional to current in each of said conductors in said group,

(c) subtracting said first current signal from said second current signal for each of said conductors to obtain a current difference, Δ, for each of said conductors,

(d) selecting said specific anode and said specific conductor in said group, and doubling said Δ to obtain a total selected current difference Δ_t for said selected conductor,

(e) adding said Δ for each said conductor adjacent to said specific conductor, to obtain a total adjacent current difference, Δ_a,

(f) subtracting said Δ_a from said Δ_t to obtain a remainder, R, for said selected conductor,

(g) comparing said R with said Δ_t for said selected conductor, and

(h) raising said specific anode when said R exceeds said Δ_t by more than about 0.5 percent.

4,174,268
ELECTRODE GUIDE

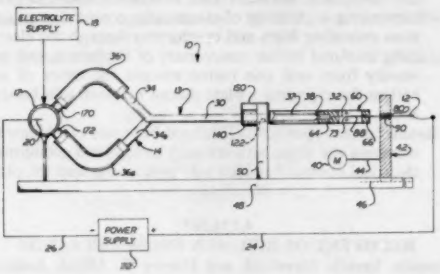
James D. Andrews, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 1, 1978, Ser. No. 938,948

Int. Cl.[2] B23P *1/02, 1/12*

U.S. Cl. 204—129.55 **46 Claims**

20. A method of drilling a hole in an axially extending workpiece, said method comprising the steps of providing an electrode, providing a guide to position the workpiece and electrode relative to each other, telescopically inserting the electrode into the guide, telescopically inserting the workpiece into the guide, supplying electrolyte under pressure to a passage through the electrode, providing an electrical potential between the electrolyte and the workpiece, and directing a



flow of electrolyte from the electrode against the portion of the workpiece in the guide to electrochemically drill a hole in the workpiece.

4,174,269
METHOD OF TREATING ELECTRODES

William W. Carlin, Portland, and Lois A. Dahlberg, Corpus Christi, both of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 21, 1978, Ser. No. 917,621

Int. Cl.[2] C25F *1/06*

U.S. Cl. 204—129.95 **6 Claims**

1. A method of preparing an iron body for receipt of a catalytic coating comprising:

contacting the iron body with an aqueous cleaning solution comprising an iron oxidation inhibitor, hydrochloric acid, and a source of hydrofluoric acid; and

thereafter maintaining the iron body anodic in an aqueous solution consisting essentially of water and a hydroxy acid until the electrode potential of the clean iron body has decreased by at least 0.01 volt.

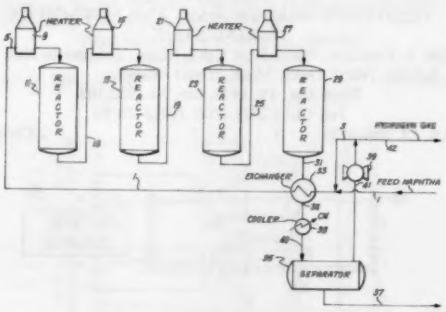
4,174,270
HIGH SEVERITY PROCESS FOR THE PRODUCTION OF AROMATIC HYDROCARBONS

Warden W. Mayes, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 3, 1977, Ser. No. 848,223

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—64 **27 Claims**



1. A process for the production of highly aromatic reformates, suitable for use as blending stocks in the blending of high aromatic content gasoline or the preparation of high purity aromatics, from a naphtha feed fraction by high severity

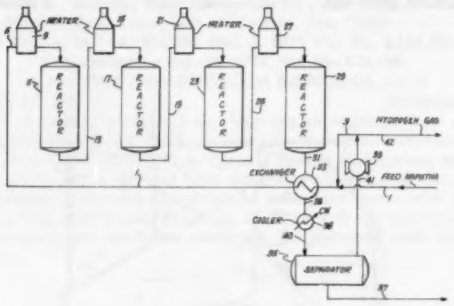
catalytic reforming, using a halogen promoted reforming catalyst, comprising reforming said naphtha feed under reforming conditions of high severity and substantial dryness in a plurality of sequentially arranged reaction zones in which the concentration of the halogen component of the reforming catalyst is adjusted to provide an enhanced hydrocracking activity to the catalyst in the last reaction zones, and a minimal hydrocracking activity to the catalyst in the first reaction zones.

4,174,271

HIGH SEVERITY REFORMING

Warden W. Mayes, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Nov. 3, 1977, Ser. No. 848,229
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—64 **30 Claims**



1. A process for the production of highly aromatic reformates, suitable for use as blending stocks in the blending of high aromatic content gasoline or the preparation of high purity aromatics, from a naphtha feed fraction by high severity catalytic reforming, using a reforming catalyst which includes a hydrocracking promotor metal, comprising reforming said naphtha feed under reforming conditions of high severity in a plurality of sequentially arranged reaction zones in which the concentration of the promotor metal of the reforming catalyst is adjusted to provide an enhanced hydrocracking activity to the catalyst in the last reaction zones, and a minimal hydrocracking activity to the catalyst in the first reaction zones.

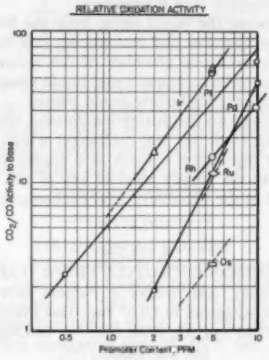
4,174,272

CATALYTIC CRACKING OF HYDROCARBONS

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 659,308, Feb. 19, 1976, Pat. No. 4,088,568, and a continuation-in-part of Ser. No. 599,920, Jul. 28, 1975, abandoned, said Ser. No. 659,308, is a continuation-in-part of Ser. No. 649,261, Jan. 15, 1976, Pat. No. 4,072,600, which is a continuation-in-part of Ser. No. 440,890, Feb. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 399,008, Sep. 20, 1973, abandoned. This application Jan. 13, 1978, Ser. No. 869,079
The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.
Int. Cl.[2] C10G *11/04*; B01J *8/24*; C01B *29/12*
U.S. Cl. 208—120 **10 Claims**

1. A method for preparing, in situ, an inventory comprising a carbon monoxide oxidation promoting metal and a cracking catalyst for use in a fluid catalytic cracking process for non-hydrogenative cracking of hydrocarbons, which cracking process comprises cofeeding active hot solid cracking catalyst and crackable hydrocarbon feed to a cracking zone; cracking said feed to lighter hydrocarbons while depositing coke on said catalyst; disengaging said coked catalyst from said lighter hydrocarbon products; passing said coked catalyst to a regeneration zone; passing an oxygen containing gas upwardly through said regeneration zone and at sufficient velocity to fluidize said catalyst contained therein, whereby maintaining therein a fluidized bed of catalyst having an ascending temperature profile; retaining said catalyst in said regeneration zone at a temperature and for a time sufficient to burn coke off said catalyst, heat and reactivate such, and produce a flue gas comprising carbon oxides; and returning said reactivated, heated catalyst to said cracking zone; said method comprising adding,



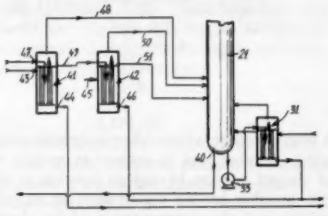
during said process into proximity to said cracking catalyst, an amount of a platinum group metal as a decomposable compound thereof, said amount being effective to increase the temperature of said fluidized bed in said regeneration zone and ineffective to substantially disadvantageously increase the production of coke in said cracking zone, thereby forming said inventory comprising said promoter metal in a proportion of 0.1 to 100 parts per million based on total catalyst.

4,174,273

SEPARATING EXCHANGERS

Pierre Cros, Paris; Jean-Pierre Desorbay, Dennemont, and Jean-Jacques Refoubelet, Paris, all of France, assignors to Spie-Batignolles and Societe Generale de Techniques et d'Etudes, both of Puteaux, France

Division of Ser. No. 717,286, Aug. 24, 1976, abandoned. This application Jan. 31, 1978, Ser. No. 873,837
Claims priority, application France, Sep. 9, 1975, 75 27570
Int. Cl.[2] B01D *3/14*; C10G *7/00*
U.S. Cl. 208—364 **2 Claims**



1. A method of heating crude oil before the introduction thereof into a distillation column at atmospheric pressure, which comprises the steps of:

(a) passing the crude oil through successive heat exchangers disposed in series, each exchanger having a lower exchange chamber and an upper separation chamber

(b) introducing in the exchange chamber of each heat exchanger steam at a pressure which increases from one heat exchanger to the other, said steam pressure reaching approximately 160 bars in the heat exchanger which precedes the crude oil distillation column,

(c) separating the crude oil by heat exchange with said steam in the successive separation chambers into a vapor phase and a liquid phase,

(d) withdrawing the vapor phase from each separation chamber and introducing said successive vapor phases separately and directly into the distillation column at different supply levels, the vapor phase of the first exchanger being introduced at a supply level higher than the supply level of any of the vapor phases separated in the other successive heat exchangers,

(e) withdrawing the liquid phase from the bottom of each separation chamber and introducing said liquid phase in the lower exchange chamber of the following heat exchanger in order to convert said liquid phase into a vapor phase and a higher boiling liquid phase,

(f) introducing into the distillation column, the liquid phase withdrawn from the heat exchanger which precedes the crude oil distillation column at a supply level disposed lower than the supply level of any of the vapor phases separated in the successive heat exchangers.

4,174,274

SEPARATION OF RUTILE FROM ILMENITE

William K. Tolley, and Beckay J. Nelson, both of Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 12, 1978, Ser. No. 868,966
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **6 Claims**

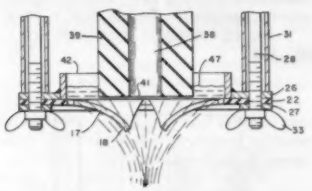
1. A method for effecting the separation of ilmenite from rutile which comprises agitating a mixture of ilmenite and rutile particles in an aqueous hydrogen peroxide solution containing a collection agent selected from the group consisting of a fatty acid and an ether amine, sparging said solution with air, skimming off the resultant froth containing the ilmenite, and recovering the desired rutile.

4,174,275

HYDROCYCLONE APPARATUS AND METHOD FOR UNDERFLOW DENSITY CONTROL

David L. Martin, Woodside, Calif., assignor to Krebs Engineers, Menlo Park, Calif.

Filed Jan. 23, 1978, Ser. No. 871,391
Int. Cl.[2] B04C *5/15*
U.S. Cl. 209—211 **6 Claims**



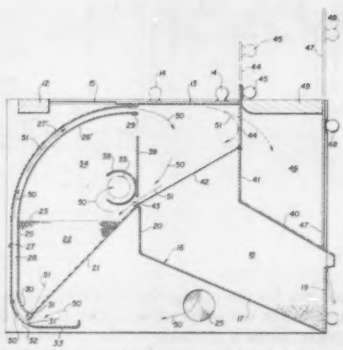
1. A hydrocyclone which when in upright position having a separating chamber that is annular in section with a lower conical shaped portion having an opening at its lower apex end, the chamber having means forming an inlet connected tangentially with the upper portion of the chamber and also having means forming an overflow outlet communicating with a vortex finder disposed axially of the chamber; the improvement comprising a plurality of sectors made of resilient material, mounting means to which the base portions of the sectors are secured, the mounting means serving to so position the sectors whereby when the sectors are relaxed they extend inwardly toward said axis in close proximity with the apex opening of the hydrocyclone, the apex of each sector being substantially aligned with the axis of the chamber and with the side edges of the sectors extending radially from the axis, the side edges of each sector being in juxtaposition with the side edges of the adjacent sectors, said sectors being flexed downwardly by discharging underflow material overlying the same when the hydrocyclone is in operation, said sectors serving to control discharge of underflow material to maintain the density of the underflow material substantially constant, irrespective of changes in the density of the feed material being supplied to the inlet, and shield means forming a wall extending upwardly from an upper face of said mounting means and surrounding the apex end of the hydrocyclone and radially spaced therefrom for retaining underflow material discharging outwardly between the lower end face of the apex opening of the hydrocyclone and the sectors.

4,174,276

HOUSEHOLD GRAIN CLEANER

Leslie Otness, R.R. 2, Box 2, Choteau, Mont. 59422

Filed Jun. 19, 1978, Ser. No. 917,109
Int. Cl.[2] B07B *1/04*
U.S. Cl. 209—250 **2 Claims**



1. A household grain cleaner comprising a pair of spaced upright side walls, baffle means extending between said side walls and defining therewith a primary vacuum chamber in the upper portion of the grain cleaner near one end thereof and a downwardly tapering grain hopper below the primary vacuum chamber in open communication therewith, one of said side walls having a vacuum port formed therein communicating directly with said primary vacuum chamber and adapted for coupling with a hose of a household vacuum cleaner, said baffle means further defining with said side walls a bottom chamber in said cleaner and below said grain hopper having a vent to ambient atmosphere, a debris storage chamber above said bottom chamber at the end of the cleaner away from said hopper and a clean grain collection chamber above said debris chamber and at the last-named end of said cleaner, separately operable closure panels for said debris and said clean grain collection chambers on the cleaner at the last-named end thereof, and another closure panel at the top of said cleaner between the clean grain collection chamber and said primary vacuum chamber, the primary vacuum chamber extending beyond one side of said hopper at the top of the hopper and toward said clean grain collection chamber and across the mouth of said debris storage chamber, a screen panel extending between said side walls at the mouth of said debris storage chamber and defining the bottom of the portion of said primary vacuum chamber which is extended beyond said hopper, another closure panel at the top of said cleaner and operable to allow the introduction of grain to be cleaned into the primary vacuum chamber and hopper, an upright baffle extending between said side walls in said primary vacuum chamber and at the side of the hopper nearest to said debris collection chamber and screen and defining therewith a restricted passage for grain entering said hopper, said screen panel being inclined to direct grain downwardly toward said restricted passage, the bottom of said hopper having a restricted outlet across the hopper and

between said side walls, and another baffle extending between said side walls and cooperating with said baffle means to define a narrow elongated grain passage at said one end of the cleaner extending from the restricted outlet of the hopper upwardly at said one end to an exit point substantially at the top of the cleaner and at the top of said primary vacuum chamber and substantially above said upright baffle, whereby grain undergoing cleaning can flow in a circuitous path from the restricted outlet of the hopper through said narrow passage, into said primary vacuum chamber and then through the restricted passage near the top of the hopper defined by said upright baffle and screen panel.

4,174,277

RESIN AND METHOD FOR REMOVING ANTIMICROBIALS FROM BODY FLUIDS

Joseph L. Melnick, 8838 Chatsworth Dr., and Craig Wallis, 11002 Hedwig Green, both of Houston, Tex. 77024

Division of Ser. No. 856,851, Dec. 2, 1977, Pat. No. 4,145,304. This application Sep. 25, 1978, Ser. No. 945,538

Int. Cl.[2] B01J *1/04;* **B01D** *15/04;* **G01N** *31/04, 33/16*

U.S. Cl. 210—36 **10 Claims**

1. A method for selectively removing an antibiotic from a bacterially infected body fluid specimen which comprises coating a microporous resin which is capable of adsorbing an antibiotic and is selected from the group consisting of anion exchange resins and non-functional adsorbent resins with a non-ionic detergent by fluidizing the resin with the non-ionic detergent, and thereafter contacting the specimen with the resin.

4,174,278

TREATMENT OF RESIDUAL EARTH DRILLING MUDS

Bernard Tramier, Pau, and Michel Guillerme, Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Aug. 29, 1977, Ser. No. 828,434

Claims priority, application France, Sep. 3, 1976, 76 26592

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—51 **4 Claims**

1. Method of dewatering muds from oil well drillings up to a content of more than 20% by weight of dry material, which comprises admixing the mud with a flocculating agent comprising 5 to 30 weight parts of calcium hydroxide per 100 weight parts of dry material present in the mud, wherein said flocculating agent contains an iron salt selected from the group consisting of ferric chloride and ferrous sulfate in a ratio of 0.05 to 0.35 equivalents of iron per equivalent of calcium and said flocculating agent contains 0.2 to 0.4 part weight of partially hydrolyzed polyacrylamide the degree of ionization of which exceeds 25% per 100 parts by weight of the dry material present in the mud, and then mechanically separating the liquid of the mud from the flocculated solids.

4,174,279

MINERAL FILLERS

Norman O. Clark, and Thomas R. Jones, both of Cornwall, England, assignors to English Clays Lovering Pochin & Co. Ltd., St. Austell, England

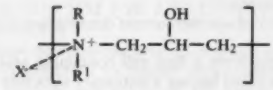
Filed Mar. 29, 1978, Ser. No. 891,197

Claims priority, application United Kingdom, Apr. 14, 1977, 15668/77

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—54 **3 Claims**

1. In a method of dewatering by pressure filtration an aqueous suspension of a kaolin clay having a particle size distribution such that it contains from 1 to 20% by weight of particles having an equivalent spherical diameter smaller than 1 micron, the improvement which comprises treating the aqueous suspension of the clay, prior to dewatering by pressure filtration at a pressure in excess of 150 pounds per square inch, with from 100 to 3000 parts by weight of a water-soluble polyelectrolyte flocculant per million parts by weight of clay, the polyelectrolyte flocculant being a polymer obtainable by copolymerising epichlorohydrin and an aliphatic secondary amine, and essentially consisting of repeating units which can be represented by the formula:



where R and R^1 are each selected from the group consisting of hydrogen, methyl and ethyl, and X is selected from the group consisting of Cl, Br, I, HSO_4, and CH_3SO_4; and said flocculant having a molecular weight (as measured by the Ostwald viscometer method) in the range of from 50,000 to 300,000.

4,174,280

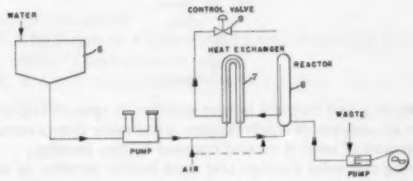
OXIDATION PROCESS

Louis A. Pradt, Wausau, and Wayne B. Gitchel, Rothschild, both of Wis., assignors to Sterling Drug Inc., New York, N.Y.

Continuation of Ser. No. 489,237, Jul. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,230, Oct. 5, 1972, abandoned. This application Oct. 20, 1978, Ser. No. 953,270

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—60 **4 Claims**



1. A process for oxidizing with an oxygen-containing gas in an aqueous medium in a sealed reactor an oxidizable material which is insoluble, immiscible and difficult to suspend or emulsify in water and selected from the group consisting of motor oils, diesel fuel, explosives and propellants, at a temperature and pressure sufficient to provide a controlled autogenic and self-sustaining oxidation reaction, which comprises passing said aqueous medium through a heat exchanger into said sealed reactor in order to heat the aqueous medium up to the required reaction temperature while supplying the reactor with an oxygen-containing gas, and at the same time injecting said oxidizable material directly into said reactor without heating said oxidizable material, thereby producing an oxidized effluent which is removed from the reactor.

4,174,281

COUNTERCURRENT DECANTATION

Christopher C. Dell, Leeds, England, assignor to National Research Development Corporation, London, England

Filed May 1, 1978, Ser. No. 901,616

Claims priority, application United Kingdom, May 3, 1977, 18453/77

Int. Cl.[2] B01D *21/10*

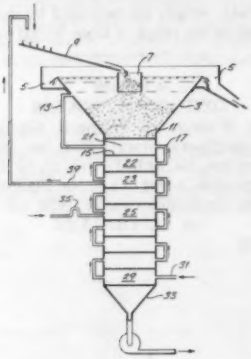
U.S. Cl. 210—83 **14 Claims**

1. Countercurrent decantation apparatus comprising a first cell and a second cell interconnected by a valve responsive to the amount of solid thereon to open, for passing the solid by gravity from the first cell into the second cell, when more than a certain amount of solid is on the valve and to close while there is still enough solid thereon to prevent bulk mixing of liquid in the second cell with liquid from the first cell, the first cell and the second cell also being interconnected by a liquid passage means, said valve comprising a stationary structure and a buoyant barrier member, said buoyant member being of

a form to enable accumulation of solids on the top thereof in cooperation with said stationary structure, so as to provide movement between an upper closed position attained in response to the buoyancy of said barrier member and a lower open position which is attained in response to downward pressure exerted by the weight of solid collected on the buoyant barrier member.

12. A method of countercurrent decantation comprising the steps of:

passing a solid from a first cell containing said solid and a liquid to a valve having a stationary structure and a buoyant barrier member, said buoyant member being of a form to enable accumulation of solids on the top thereof in cooperation with said stationary structure;



permitting said buoyant barrier member to open in response to the amount of solids thereon when more than a certain amount of solid is on said buoyant barrier member;

passing said solid through said open barrier member of said valve and into a second cell containing said liquid;

permitting said buoyant barrier member to close in response to its buoyancy with respect to said liquid while there is a sufficient amount of solid on said buoyant barrier member to prevent mixing of said liquid in said first and second cells; and

passing said liquid from said second cell to said first cell by means independent of said valve.

4,174,282

LIQUID TREATMENT APPARATUS

Donald J. Butterworth, Stirling, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sep. 18, 1978, Ser. No. 943,403

Int. Cl.[2] B01D *29/16*

U.S. Cl. 210—/232 **10 Claims**

1. A liquid filter comprising:

A. a pressurized vessel having an untreated liquid inlet and a treated liquid outlet;

B. a tube sheet spanning a portion of said vessel and defining an untreated liquid chamber communicating with said inlet and a treated liquid chamber communicating with said outlet;

C. a plurality of generally cylindrical pipes connected to said tube sheet and projecting into said untreated liquid chamber, the inside of said pipes communicating with said treated liquid chamber through said tube sheet;

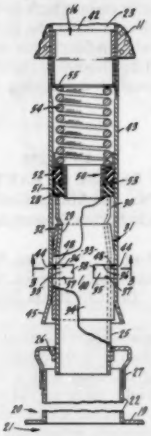
D. a plurality of elongated porous filter elements, each having a closed end and an open end, each of said open ends being axially aligned with one of said pipes and communicating with said treated liquid chamber through its associated pipe;

E. means for releasably connected each filter element to a pipe, comprising:

1. means defining a pair of identical opposed shoulders extending partially around and projecting transversely from said pipe outwardly away from its axis, said shoulders facing toward said tube sheet, and means defining a pair of opposed identical ridges extending axially along said pipe between said shoulders toward said tube sheet, the outside surfaces of said ridges being farther from said axis than said shoulders;

2. an open-ended central support cylinder having one end rigidly attached to the open end of said filter element, the interior of said support cylinder communicating with the interior of said filter element, there being a pair of identical, transversely aligned slits cutting partially through opposite surfaces of said cylinder in a plane perpendicular to the axis of said cylinder, said cylinder telescoping over and being coaxial with said pipe, said cylinder being movable with respect to said pipe, and the terminal end of said pipe facing said open end of said filter element within said cylinder; and

3. a spring clip at least partially surrounding the outside of



said cylinder, opposed portions of said clip being biased towards each other, each of said opposed portions extending into and being retained by one of said aligned slits, said opposed portions normally being separated by a distance less than the distance separating said shoulders on said pipe, and said pipe extending into said cylinder until said slits are located closer to said tube sheet than said shoulders, whereby said opposed portions are biased into a locking position connecting said filter element to said pipe when said opposed portions are in contact with said shoulders, and said opposed portions are spread to a release position for disconnecting said filter element and said pipe when said opposed portions are moved into contact with said ridges; and

F. a spring-biased sliding seal in the central support cylinder of each filter element contacting said terminal edge of said pipe for preventing leakage from said untreated liquid chamber between said filter elements and pipes into said treated liquid chamber.

4,174,283

METHOD OF FRACTURING WITH GELLED ORGANIC LIQUIDS

Thomas J. Griffin, Jr., Sand Springs, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 655,919, Feb. 6, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,114
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.[2] E21B *43/26*; C07F *9/09, 9/11*
U.S. Cl. 252—8.55 R 37 Claims

1. In the process of fracturing a subterranean formation wherein the viscosity of an organic liquid selected from the group consisting of aliphatic hydrocarbons, aliphatic halogenated hydrocarbons, xylene, and crude oil is first increased an effective amount above its normal viscosity by the addition of a thickening agent and then is introduced into and through a borehole which penetrates said subterranean formation at a sufficient pressure to fracture the formation the improvement which comprises: thickening said organic liquid by mixing therewith an effective quantity of both an aluminum activator compound selected from the group consisting of an alkali metal aluminate, aluminum isopropoxide and hydrated alumina, and an organic phosphate ester composition prepared by the process which comprises the reaction of:

A. a pentavalent phosphorus compound selected from the group consisting of P_2O_5 and a mixture of P_2O_5 with polyphosphoric acid;

B. a hydroxy ether of the formula ROR_1OH wherein R is a C_1 to C_6 alkyl group, R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 range from 3 to about 8; and

C. when the total carbon atoms of R and R_1 is 3 or 4, a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, but when the total carbon atoms of R and R_1 is 5 to 8, an alcohol selected from the group consisting of a long chain substantially unsubstituted monohydric aliphatic alcohol containing at least 5 carbon atoms, a short chain substantially unsubstituted monohydric aliphatic alcohol containing from 1 to 4 carbon atoms and a mixture of said alcohols,

the individual mole ratios of the hydroxy ether, the long chain alcohol and the short chain alcohol to total P_2O_5 being within the ranges of 0.4:1 to 4.5:1, 0:1 to 4.0:1 and 0:1 to 5.0:1 respectively, said reaction being conducted at temperature ranging from about 70° to about 90° C. for a period of time of from about 1.5 to about 6 hours, and said phosphorus compound, hydroxy ether, and alcohol or alcohols being provided in molar ratios and admixed in a sequence effective to provide a reaction product suitable for use in thickening said organic liquid.

4,174,284

HYDROCARBYLPOLYTHIOBENZOIC ACIDS AS ANTI-OXIDATION ADDITIVES

Albert W. Borel, St. Meinrad, Ind., and Bernard A. Baldwin, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1978, Ser. No. 933,347
Int. Cl.[2] C10M *1/38*
U.S. Cl. 252—48.6 12 Claims

1. An organic composition comprising a major proportion of a hydrocarbon liquid and an oxidation-inhibiting amount of a hydrocarbylpolythiobenzoic acid.

9. A method for rendering a hydrocarbon liquid resistant to oxidation by incorporating into said hydrocarbon liquid an oxidation-inhibiting amount of a hydrocarbylpolythiobenzoic acid.

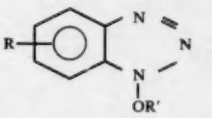
4,174,285

LUBRICANT COMPOSITIONS AND ETHER OR ESTER OF 1-HYDROXYBENZOTRIAZOLE AS ANTIOXIDANT IN THE COMPOSITIONS

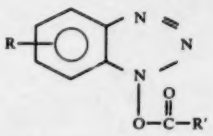
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,763
Int. Cl.[2] C10M *1/20, 1/32*; C07D *249/18*
U.S. Cl. 252—51.5 A 12 Claims

1. A lubricant composition which comprises a lubricant, and in an amount effective to impart anti-oxidation properties thereto, an additive selected from the group consisting of ethers and esters of 1-hydroxybenzotriazole having the formula:



and



respectively, where

R is hydrogen or a hydrocarbyl group containing from 1 to about 12 carbon atoms, and

R′ is a hydrocarbyl group containing from 1 to 16 carbon atoms.

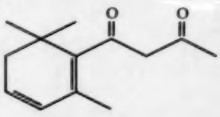
4,174,286

1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1,3-BUTANEDIONE AND ORGANOLEPTIC USES THEREOF

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 887,630, Mar. 17, 1978, Pat. No. 4,157,351.
This application Nov. 17, 1978, Ser. No. 961,687
Int. Cl.[2] C11D *3/50*
U.S. Cl. 252—174.11 4 Claims

1. A process for preparing a detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.005% up to 3% of an equilibrium mixture containing compounds having the structures:



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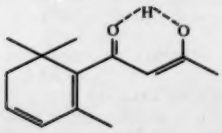


4,174,287

2,3-DIMETHYL-5-(2,2,3-TRIMETHYL-3-CYCLOPENTEN-1-yl)-2-PENTANOL, PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES CONTAINING SAME AND PROCESS FOR PREPARING SAME

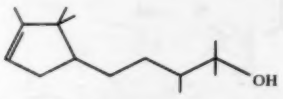
Venkatesh Kamath, Red Bank; Braja D. Mookherjee, and Frederick L. Schmitt, both of Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 893,542, Apr. 5, 1978, Pat. No. 4,149,020. This application Dec. 8, 1978, Ser. No. 968,008

Int. Cl.[2] C11D *3/50*

U.S. Cl. 252—174.11 **2 Claims**

1. A process for preparing a solid or liquid detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.01% up to 0.5% by weight of said solid or liquid detergent of a compound having the structure:



4,174,288

MALTYL-2-METHYL ALKENOATES AND NOVEL PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING SAME

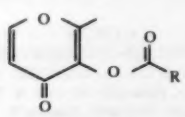
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 884,381, Mar. 8, 1978. This application Sep. 15, 1978, Ser. No. 942,530

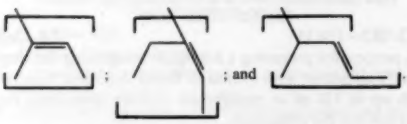
Int. Cl.[2] C11D *3/50*

U.S. Cl. 252—174.11 **6 Claims**

1. A process for preparing a detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.05% up to 2.0% of a maltyl-2-methyl alkenoate having the structure:



wherein R is a moiety selected from the group consisting of:



4,174,289

LIQUID DETERGENT-BLEACH CONCENTRATES HAVING HIGH ALKALINITY

Malachi E. Sorgenfrei, Grosse Ile, and Donald F. Garvin, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 819,261, Jul. 27, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,691

Int. Cl.[2] C11D *7/54*

U.S. Cl. 252—103 **8 Claims**

1. A cleaning and bleaching liquid composition consisting essentially of an aqueous solution of:

A. about 2% to about 15% by weight, calculated as available chlorine, of an alkali metal hypochlorite,

B. about 15% to about 200% by weight of an alkali metal salt of an alkylated diphenyl oxide sulfonic acid based upon said alkali metal hypochlorite weight,

C. about 5% to about 20% by weight of an alkali metal hydroxide, and

D. about 0.1 mole to about 1.5 mole of an alkali metal chloride per mole of said hypochlorite

wherein said alkali metal is selected from the group consisting of sodium, potassium, and lithium, and wherein said alkylated diphenyl oxide sulfonic acid contains about 8 to about 22 carbon atoms in the alkyl moiety.

4,174,290

METAL OXIDE REMOVER CONTAINING A STRONG MINERAL ACID, CITRIC ACID AND A BASIC AMMONIA DERIVATIVE

Newton G. Leveskis, Auburn, Calif., assignor to Custom Research and Development, Auburn, Calif.

Continuation-in-part of Ser. No. 751,771, Dec. 16, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,443

Int. Cl.[2] C11D *7/26, 7/08, 7/32*

U.S. Cl. 252—142 **15 Claims**

1. A composition for removing metal oxides from ferrous metals comprising: an aqueous solution containing a basic ammonia derivative selected from ammonium hydroxide and organic amines, citric acid and a strong mineral acid, all of said components being present in effective concentrations to remove metal oxides from the metal to be cleaned in the absence of acid corrosion and discoloration thereof, the pH of said solution being about 0.5–3.0 and the weight ratio of said ammonia derivative to said citric acid being about 2:7 to 7:2.

4,174,291

CRYSTALLIZATION SEED-CONTAINING COMPOSITION

Lawrence Benjamin; Jay H. Saylor, and Vernon A. Uchtman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 248,545, Apr. 28, 1972, abandoned. This application Jul. 8, 1974, Ser. No. 486,297

Int. Cl.[2] C11D *7/12*

U.S. Cl. 252—156 **13 Claims**

1. A substantially dry detergent composition consisting essentially of:

(a) from 5% to 50% of a water-soluble organic detergent selected from the group consisting of alkyl ether sulfates of the formula

$$RO(C_2H_4O)_xSO_3M$$

wherein R is alkyl or alkenyl of from about 10 to about 20 carbon atoms, x is 1 to 30, and M is a salt forming cation; the condensation product of an aliphatic alcohol having from 8 to 22 carbon atoms and from 5 to 30 moles of ethylene oxide; and an amine oxide of the formula

$$R^1R^2R^3N\rightarrow O$$

wherein R^1 is an alkyl group containing from about 10 to about 28 carbon atoms, from 0 to about 2 hydroxy groups and from 0 to about 5 ether linkages, and R^2 and R^3 are selected from the group consisting of alkyl radicals and hydroxy alkyl radicals containing from about 1 to about 3 carbon atoms;

(b) from 20% to 80% of a material selected from the group consisting of water-soluble salts of carbonates, bicarbonates and sesquicarbonates; and

(c) from 0.1% to 60% of calcium carbonate particles having a maximum particle dimension of less than 20 microns.

4,174,292

SPILL CONTROL COMPOSITION AND USE THEREOF

James W. Seidenberger, Bethlehem, and Francis W. Michelotti, Easton, both of Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Mar. 20, 1978, Ser. No. 888,230
Int. Cl.[2] C09K *3/32*; B01J *1/22*
U.S. Cl. 252—189 6 Claims

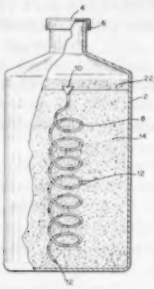
1. A composition useful for the control and cleanup of mineral acid spills comprising: about 55 to 99% by weight of a non-volatile organic amine component selected from the group consisting of a water soluble polyethylineimine polymer or an alkanolamine; from about 0 to 45% by weight water, from about 0.01 to 2% by weight pH indicator changing color in the range pH 4.0 to 10.0, from about 0 to 10% by weight dissolved gas, from about 0.2 to 3% by weight of a surfactant which is foam-forming under acidic or neutral conditions and from about 0 to 1% by weight of a color tinting agent.

4,174,293

PROCESS FOR DISPOSAL OF AQUEOUS SOLUTIONS CONTAINING RADIOACTIVE ISOTOPES

Peter Colombo, Patchogue; Robert M. Neilson, Jr., Setauket, and Walter W. Becker, Shoreham, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1977, Ser. No. 841,410
Int. Cl.[2] G21F *9/20*
U.S. Cl. 252—301.1 W 7 Claims



1. A process for the disposal of aqueous solutions containing radioactive waste material comprising;

(a) densifying dry particulate portland cement in a sealable leak-proof container to a bulk density ranging from about 1.3 to about 1.8 grams per cubic centimeter, said cement having a particle size ranging from about 120 mesh to about 400 mesh;

(b) dispersing without mechanical agitation from about 15 weight percent to about 30 weight percent of the aqueous solution based upon the weight of the densified cement in-situ within the densified cement;

(c) sealing said densified cement containing said aqueous solution off from the atmosphere until the said aqueous solution is hydrated with said cement;

(d) impregnating the hydrated cement with a mixture of monomer and a polymerization catalyst and polymerizing the monomer in-situ within the pregnant hydrated cement;

(e) storing said pregnant hydrated cement in a suitable storage area;

(f) maintaining the temperature of the materials utilized in the process at a temperature below 99° C. throughout steps a thru e of the process.

4,174,294

FLUORESCENT MATERIAL

Katsuo Murakami; Mitsuoki Otani; Hiroshi Ito, all of Kamakura; Kenzo Awazu, Amagasaki; Sumiaki Ibuki, Kamakura, and Toshiyuki Takeda, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 954,474
Claims priority, application Japan, Dec. 20, 1977, 52-153473
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 P 3 Claims

1. An alkaline earth metal boron phosphate fluorescent material activated by divalent europium having the formula $m(Sr_{1-x-y-p}Ba_xCa_yEu_pO)\cdot(1-n)P_2O_5\cdot nB_2O_3$ wherein parameters x,y,p,m, and n are respectively in the ranges:

$0 \leqq x \leqq 0.5$
$0 \leqq y \leqq 0.2$
$0.001 \leqq p \leqq 0.15$
$1.75 \leqq m \leqq 2.30$ and
$0.05 \leqq n \leqq 0.23$

4,174,295

AEROSOL PROPELLANT COMPOSITIONS

Gianangelo Bargigia; Gerardo Caporiccio, and Giuliano Carniselli, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Aug. 9, 1977, Ser. No. 823,152
Claims priority, application Italy, Aug. 13, 1976, 26269 A/76; Jun. 1, 1977, 24249 A/77; Jun. 10, 1977, 24579 A/77
Int. Cl.[2] C09K *3/30*; A61L *9/04*; A61K *7/06, 9/12*
U.S. Cl. 252—305 5 Claims

1. A propellant composition for use with aerosols, the composition consisting essentially of a mixture of:

(A) from 5 to 60% by weight, based on the total weight of the propellant composition, of a hydrogen-containing fluorocarbon selected from the group consisting of CH_2F_2 and CF_3—CH_3, and

(B) from 40 to 95% by weight, based on the total weight of the propellant composition, of a hydrogen-containing chlorofluorocarbon or a hydrogen-containing fluorocarbon, each being selected from the group consisting of CF_3—$CHClF$, CF_3—CH_2Cl, CF_3—CH_2F, $CClF_2$—CH_3 and CHF_2—CH_3.

4. A propellant composition for use with aerosols, the composition consisting essentially of, in admixture:

(A) from 5 to 60% by weight, based on the total weight of the propellant composition, of the hydrogen-containing fluorocarbon CH_2F_2;

(B) from 5 to 95% by weight, based on the total weight of the propellant composition, of a hydrogen-containing chlorofluorocarbon or a hydrogen-containing fluorocarbon, each being selected from the group consisting of CF_3—$CHClF$, CF_3—CH_2Cl, CF_3—CH_2F, $CClF_2$—CH_3 and CHF_2—CH_3; and

(C) up to 50% of a hydrocarbon selected from the group consisting of n-butane and iso-butane.

4,174,296

WATER SOLUBLE LECITHIN COMPOSITION

Gus S. Kass, Skokie, Ill., assignor to American Lecithin Company, Atlanta, Ga.

Filed Dec. 4, 1978, Ser. No. 965,998
Int. Cl.[2] B01J *13/00*; C11D *9/30*; A23J *7/00*
U.S. Cl. 252—312 20 Claims

1. Method of increasing the solubility of lecithin, said method comprising the step of adding to an aqueous dispersion of lecithin an amount of solubilizing agent sufficient to solubilize the lecithin, said solubilizing agent selected from the group consisting of tertiary amine oxides, alkyl alcohol sulfate salts, alkylamidopropyl betaines, sodium alkene sulfonates, alkyl sulfo acetates and disodium salt of monoalkyl amide of sulfosuccinate.

4,174,297

POLYHYDRIC PHENOL COESTER STABILIZERS

William E. Leistner, Atlantic Beach, N.Y.; Motonobu Minagawa, Kosigaya, Japan; Yutaka Nakahara, Iwatsuki, Japan, and Tohru Haruna, Okeqawa, Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,110
Claims priority, application Japan, Nov. 10, 1975, 50-134971
Int. Cl.[2] C08G *63/62*; C08J *3/20*; C08L *69/00*
U.S. Cl. 252—399 13 Claims

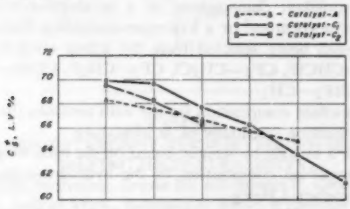
1. A coester stabilizer having a molecular weight measured by a vapor pressure method between 700 and about 10,000, of at least one polyhydric phenol having 2 to 3 phenolic hydroxyl groups and 1 to 3 benzenoid rings, with carbonic acid and an aliphatic dicarboxylic acid having 4 to 10 carbon atoms and not more than one thioether sulfur atom, in which the molar proportions of carbonic acid to aliphatic dicarboxylic acid range from 19:1 to 1:19.

4,174,298

ACTIVATED MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 867,859, Jan. 9, 1978. This application Sep. 21, 1978, Ser. No. 944,504
Int. Cl.[2] B01J *27/10, 27/08, 23/42, 23/46*
U.S. Cl. 252—441 17 Claims



1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhodium carbonyl component with a porous carrier material containing a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

4,174,299

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Umberto Giannini, Milan; Enrico Albizzati, Arona; Sandro Parodi, Oleggio, and Franco Pirinoli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 707,018, Jul. 20, 1976, abandoned. This application Jun. 27, 1978, Ser. No. 919,495
Claims priority, application Italy, Jul. 21, 1975, 25588 A/75
Int. Cl.[2] C08F *4/64, 4/68*
U.S. Cl. 252—429 B 14 Claims

1. Components for catalysts useful in the polymerization of olefins, said components having the general formula

$$MM'TY.nE$$

in which

M = Mg, Mn or Ca;

M' = Ti, V or Zr;

T = oxygen, the anion CO_3'', or a pair of monovalent groups selected from the group consisting of

$$\begin{pmatrix}-OH\\-OH,\end{pmatrix}\quad\begin{pmatrix}-OH\\-CL,\end{pmatrix}\quad\begin{pmatrix}-OR\\-OR,\end{pmatrix}\quad\begin{pmatrix}-OR\\-Cl\end{pmatrix}$$

in which groups R is an alkyl, cycloalkyl, aryl or alkylaryl radical containing from 1 to 20 carbon atoms;

Y = halogen or halogen and alkoxy groups, said halogen or halogen and alkoxy groups being present in a number to satisfy the valence of the metal M';

n = a number from 0.5 to 20, inclusive; and

E = a hydrocarbyl electron donor compound selected from the group consisting of

(a) esters of organic carboxylic acids;
(b) ethers;
(c) amines;
(d) esters of carbonic acid;
(e) nitriles;
(f) esters of phosphoric or phosphorous acid; and
(g) phosphorus oxychloride.

4,174,300

PREPARATION OF HIGHLY ACTIVE COPPER-SILICA CATALYSTS

Sambasivarao Koritala, Peoria, Ill., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,572
Int. Cl.[2] B01J *29/00*
U.S. Cl. 252—454 6 Claims

1. In a method for preparing highly active and selective linolenate-reducing, copper-silica catalysts including the steps of:

a. reacting sodium silicate from an aqueous solution with a water-soluble copper salt to form a precipitate;
b. recovering said precipitate from said aqueous solution;
c. drying said recovered precipitate from step (b); and
d. heat treating said dried precipitate from step (c) at a temperature in the range of 350°–625° C. to yield said catalyst,

the improvement comprising conducting said drying in step (c) under a vacuum at room temperature or less.

4,174,301

POLYCARBOXYLIC ACIDS AS EXTRUSION AIDS FOR SILICA-ALUMINAS

Monica E. Choca, Chicago, and Gerald R. Feistel, Hinsdale, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 829,541, Aug. 31, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,838

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 R **7 Claims**

1. A process for preparing silica-alumina extrudates having a relatively high crush strength, relatively high shrinkage on calcination and relatively reduced pore volume in pores above 600 A diameter consisting essentially of:

A. Preparing a purified silica-alumina powder comprising on a dry basis 10–60% SiO_2 and 40–90% Al_2O_3;

B. Mixing said purified silica-alumina powder with water and from 0.1–15% by weight of a water-soluble polycarboxylic acid containing from 2–10 carbon atoms based on the dry weight of the powder;

C. Adjusting the moisture content of said silica-alumina powder to an extrudable level so as to allow extrusion; and then,

D. Extruding said silica-alumina powder to prepare a silica-alumina extrudate whereby the extrusion rate is improved over silica-alumina powders not so treated.

3. The process of claim 1 wherein the silica-alumina extrudate is dried and calcined to prepare a catalyst support.

4,174,302

CATALYST FOR PRODUCTION OF CYCLOALKYLAROMATICS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 608,597, Aug. 28, 1975, Pat. No. 4,115,463. This application Aug. 14, 1978, Ser. No. 933,343

Int. Cl.[2] B01J *29/06, 29/12*

U.S. Cl. 252—455 R **6 Claims**

1. A catalyst for the conversion of monocyclic aromatic and alkyl-substituted monocyclic aromatic hydrocarbons consisting essentially of from about 0.01 to 0.3 weight percent ruthenium, from about 0.03 to 1 weight percent nickel and a support material selected from the group consisting of active clay and synthetic silica-alumina in a weight ratio of ruthenium to nickel in the approximate range of 0.01 to 0.3:1.

2. The catalyst of claim 1 wherein said nickel is present in said catalyst as nickel bromide.

4,174,303

CERAMIC ELECTRICAL MATERIAL WITH HIGH NONLINEAR RESISTANCE

Severino Gaiffi, and Hans-Peter Klein, both of Nussbaumen, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jun. 30, 1977, Ser. No. 811,867

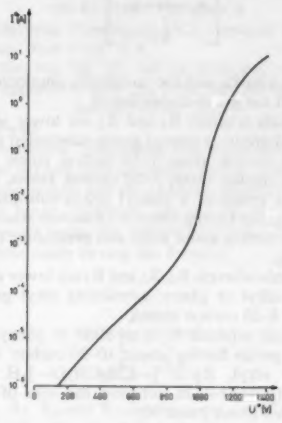
Claims priority, application Switzerland, Jul. 1, 1976, 8425/76

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—518 **14 Claims**

1. A method of producing a ceramic electrical material having a high non-linear resistance, which consists essentially of 50–99.9 mol % of zinc oxide, 0.5 to 3 mol % of at least one oxide of silicon; wherein said ceramic material contains essentially no bismuth oxide; which comprises the steps of: mixing the starting materials in powder form and with grain size of from 0.1 to 1μ; drying; sifting; calcining at about 450° C. for



from 1 to 3 hours; pressing; and subjecting the resulting briquette to a heat treatment.

4,174,304

SURFACTANT SYSTEM

John J. Flanagan, Chicago, Ill., assignor to Bullen Chemical Company Midwest, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 832,364, Sep. 12, 1977, abandoned, and a continuation-in-part of Ser. No. 601,054, Aug. 1, 1975, Pat. No. 4,065,409. This application Dec. 20, 1977, Ser. No. 862,595

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] C11D *1/62, 1/75, 1/825, 1/835*

U.S. Cl. 252—524 **9 Claims**

4. A high foam degreasing cleaner constituting a mixture including about 0.45 parts by weight of a surfactant system comprising

a. about 25–75% by weight of a non-ionic detergent which is a condensation product of about 4–16 moles of ethylene oxide with one mole of a compound selected from the group consisting of

(1) an alkyl phenol having about 7–10 carbon atoms in the alkyl group;

(2) an alkyl amine having about 12–16 carbon atoms in the alkyl group;

(3) an aliphatic alcohol having about 12–16 carbon atoms; and

(4) a hydrophobic base formed by condensing propylene oxide with propylene glycol;

b. about 5–65% by weight of an amine oxide selected from the group consisting of

(1) alkyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(2) alkyl di(hydroxy lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(3) alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and

(4) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms;

said amine oxides being present in a total concentration of about 38.3% to about 43.3% by weight of said system;

c. about 8–50% by weight of a quaternary ammonium halide having the formula

wherein X is a halide and the quaternary ammonium radical is selected from the group consisting of

(1) radicals wherein R_1 and R_2 are lower alkyl, R_3 is a phenyl group or phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20 carbon atoms, and R_4 is a phenyl group or a phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20, and preferably 12–18 carbon atoms;

(2) radicals wherein R_1, R_2 and R_3 are lower alkyl, and R_4 is an alkyl or phenyl-substituted alkyl group having about 8–20 carbon atoms;

(3) radicals wherein R_1 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_2 is lower alkyl, R_3 is $[-CH_2CH_2O-]_xH$, and R_4 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between about 2 and 50;

d. about 0.2 parts by weight of sodium metasilicate;

e. about 0.2 parts by weight of sodium hydroxide;

f. about 0.07 parts by weight of tetrasodium ethylene diamine tetraacetate; and

g. the remainder water.

8. A surfactant system comprising:

a. about 25–75% by weight of a non-ionic detergent comprising about 25% by weight of a condensation product of 4–5 moles of ethylene oxide with 1 mole of nonyl phenol, and about 75% by weight of a condensation product of 8–12 moles of ethylene oxide with 1 mole of nonyl phenol;

b. about 5–65% by weight of an amine oxide selected from the group consisting of

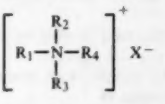
(1) alkyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(2) alkyl di(hydroxy lower alkly) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms;

(3) alkylamidopropyl di(lower alkyl) amine oxides in which the alkyl group has about 10–20 carbon atoms and the lower alkyl groups have about 1–7 carbon atoms; and

(4) alkyl morpholine oxides in which the alkyl group has about 10–20 carbon atoms;

c. about 8–50% by weight of a quaternary ammonium halide having the formula



wherein X is a halide and the quaternary ammonium radical is selected from the group consisting of

(1) radicals wherein R_1 and R_2 are lower alkyl, R_3 is a phenyl group or phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20 carbon atoms, and R_4 is a phenyl group or a phenyl group substituted with an alkyl group having about 1–18 carbon atoms or an alkyl group having about 8–20, and preferably 12–18 carbon atoms;

(2) radicals wherein R_1, R_2 and R_3 are lower alkyl, and R_4 is an alkyl or phenyl-substituted alkyl group having about 8–20 carbon atoms;

(3) radicals wherein R_1 is an alkyl or phenyl-substituted alkyl group having about 10–20 carbon atoms, R_2 is lower alkyl, R_3 is $[-CH_2CH_2O-]_xH$, and R_4 is $[-CH_2CH_2O-]_yH$, wherein the sum of x and y is between about 2 and 50; and

d. the remainder water.

4,174,305

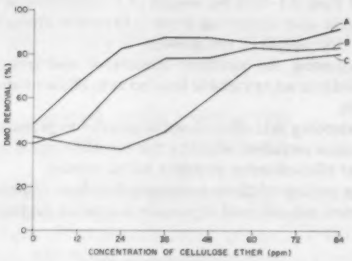
ALKYL BENZENE SULFONATE DETERGENT COMPOSITIONS CONTAINING CELLULOSE ETHER SOIL RELEASE AGENTS

Michael E. Burns, Fairfield, and Charles H. Nicol, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 560,766, Apr. 2, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,479

Int. Cl.[2] C11D *1/22, 3/22*

U.S. Cl. 252—545 **27 Claims**



1. A detergent composition, comprising:

(a) from about 5% to about 50% by weight of a surfactant component consisting essentially of a water-soluble alkyl benzene sulfonate wherein the alkyl substituent has a chain length in the range of C_{10}–C_{12}, or mixtures thereof, said surfactant component being substantially free of C_{13} and higher alkyl benzene sulfonates;

(b) from about 0.1% to about 3% by weight of a water-soluble soil release ether component selected from the group consisting of alkyl cellulose ethers, hydroxyalkyl cellulose ethers and hydroxyalkyl alkyl cellulose ethers;

(c) from about 0% to about 70% by weight of a detergency builder component; and

(d) the balance of the composition comprising detergency adjunct materials and carriers selected from a group consisting of water, water/ethanol mixtures, perfumes, optical bleaches, fillers, anti-caking agents, fabric softeners, perborate bleaches, and enzymes and mixtures thereof.

4,174,306

DETERGENT COMPOSITIONS CONTAINING SELF-SEQUESTERING SURFACTANTS

Salvatore Gafa, and Fulvio Burzio, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

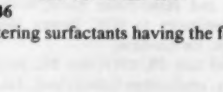
Filed Feb. 27, 1978, Ser. No. 881,390

Claims priority, application Italy, Feb. 28, 1977, 20747 A/77

Int. Cl.[2] C11D *1/04*

U.S. Cl. 252—546 **9 Claims**

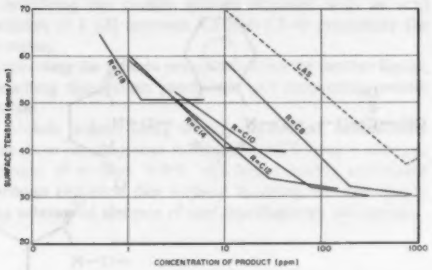
1. Self-sequestering surfactants having the following general formula (I):



in which

R is alkyl, arylalkyl or alkylaryl containing from 6 to 18 carbon atoms; and

at least two Z groups are a $CH_2—COO^-Me^+$ carboxymethylene group in which me^+ is an ion selected from the group consisting of sodium, potassium and ammonium ions or a quarternary onium cation, or combinations of the same and any Z group which is not a $CH_2—COO^-Me^+$ carboxymethylene group as defined is a hydrogen atom.



4,174,307

ROOM-TEMPERATURE-RADIATION-CURABLE POLYURETHANE

William Rowe, Westfield, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 617,614, Sep. 29, 1975, abandoned, which is a continuation of Ser. No. 315,212, Dec. 14, 1972, abandoned. This application Jul. 31, 1978, Ser. No. 929,155

Int. Cl.[2] C08G *18/67;* **C08L** *75/04, 91/00*

U.S. Cl. 204—159.19 **10 Claims**

1. An ultraviolet radiation room temperature curable monomeric substantially water-insoluble composition which comprises the admixture of,

I. the reaction product of,

A. one equivalent of an isocyanate containing intermediate which is the reaction product of

(i) about one equivalent of an organic, monomeric compound which contains more than one active hydrogen with

(ii) two equivalents of an organic polyisocyanate and,

B. one equivalent of a monomeric olefinically unsaturated compound containing exactly one active hydrogen and,

II. a photoinitiator

said composition being a monomeric, solvent free liquid containing zero percent free isocyanate groups.

4,174,308

FORMING INSULATION FROM SCRAP RUBBER

Rocco J. DiSanto, 103 Read St., Portland, Me. 04103

Filed Apr. 4, 1978, Ser. No. 893,477

Int. Cl.[2] C08J *9/08, 9/14*

U.S. Cl. 260—2.3 **8 Claims**

1. A method of forming foamed thermal insulating material comprising mixing used scrap rubber in particulate form with a heat expansible conventional flour binder material and a mixture which is a levening agent such as yeast or baking powder with a liquid such as water and baking the mixture thereby created to form a foamed product.

4,174,309

POLYISOCYANATE CROSS-LINKED ALKYLENE OXIDE-LINEAR NON-IONIC POLYSACCHARIDE REACTION PRODUCT

Stamoulis Stournas, Flemington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

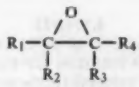
Division of Ser. No. 708,727, Jul. 26, 1976, Pat. No. 4,096,074. This application Mar. 20, 1978, Ser. No. 888,485

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—13 **7 Claims**

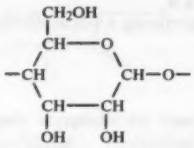
1. A composition comprising the water-soluble reaction product of an organic polyisocyanate having at least two reactive isocyanato groups and the addition product of an alkylene oxide and a linear, non-ionic polysaccharide, said addition product having a molecular weight of at least about 100,000,

said alkylene oxide having the formula



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the class consisting of hydrogen and lower alkyl groups containing from one to five carbon atoms,

said linear, non-ionic polysaccharide formed of repeating structural units having the formula



said addition product being cross-linked by said polyisocyanate such that there is a minimum of an average of one cross link for every 2,000 of said repeating structural units up to a maximum of an average of one cross link for every 20 of said repeating structural units.

4,174,310

PROCESS FOR PRODUCING AQUEOUS UREA-FORMALDEHYDE

Donald A. Hubbard, Cambridge, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1977, Ser. No. 808,429

Claims priority, application United Kingdom, Jun. 23, 1976, 26125/76

Int. Cl.[2] C08G *12/12, 12/32*

U.S. Cl. 260—29.4 R **9 Claims**

1. A process for producing aqueous urea- and/or melamine-formaldehyde resin solutions which comprises the steps of:

(a) forming a first reaction mixture containing substantial amounts of methylol urea and/or methylol melamine products by condensing, under neutral or alkaline conditions, reactants comprising urea and/or melamine and formalin in the form of an aqueous formalin solution (35% to 45% w/w) in a molecular ratio within the range urea and/or melamine:formaldehyde = 1:3 to urea and/or melamine:formaldehyde = 1:1.5;

(b) vacuum evaporating the reaction mixture to form a concentrated mixture having a solids content of 55% to 80% by weight, and

(c) with no further addition of formaldehyde to the concentrated mixture further condensing the concentrated mixture under acid conditions to produce a resinous material.

4,174,311
HARDENABLE COMPOSITION CONTAINING DIISOPROPYLBENZENE DIHYDROPEROXIDE

Tatsuo Nakano; Shozo Hori, and Ikuji Kishi, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 863,049
Claims priority, application Japan, Feb. 22, 1977, 52-18478
Int. Cl.[2] C08F *4/34, 18/00, 20/00*; C08L *91/00*
U.S. Cl. 260—28.5 R **9 Claims**

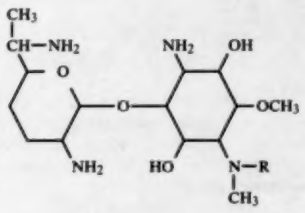
1. A hardenable composition which consists essentially of (1) an acrylate and/or a methacrylate monomer, wherein the monomer contains more than 50 wt. % of acrylate and/or methacrylate, (2) more than 0.5 wt. part of a hardener consisting essentially of diisopropylbenzene dihydroperoxide and (3) more than 0.01 wt. part of a hardening accelerator to 100 wt. parts of total monomers.

4,174,312
4-N-ACYLFORTIMICIN B DERIVATIVES AND THE CHEMICAL CONVERSION OF FORTIMICIN B TO FORTIMICIN A

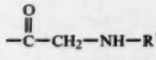
John S. Tadanier; Jerry R. Martin, and Paul Kurath, all of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 888,085, Mar. 20, 1978, which is a division of Ser. No. 725,829, Sep. 23, 1976, Pat. No. 4,091,032. This application Nov. 1, 1978, Ser. No. 956,752
Int. Cl.[2] C07C *103/52*; C07D *309/22*; A61K *37/00*
U.S. Cl. 260—112.5 R **1 Claim**

1. A method of preparing a 4-N-acylfortimicin B derivative of the structure



wherein R is



where R^1 is an acyl radical derived from an amino acid or a short peptide, and the pharmaceutically acceptable salts thereof, which method comprises the steps of:

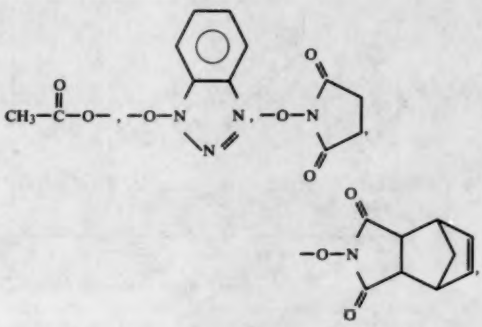
(a) acylating 1,2',6'-tri-N-benzyloxycarbonylfortimicin B with the N-hydroxy-5-norbornene-2,3-dicarboximide active ester of N-tert-butyloxycarbonylglycine in an inert solvent at 0° C. for 1–2 hours and then for 12–48 hours at ambient temperature to provide 4-N-(N-tert-butyloxycarbonylglycyl)-1,2',6'-tri-N-benzyloxycarbonylfortimicin B;

(b) treating said 4-N-(N-tert-butyloxycarbonylglycyl)-1,2',6'-tri-N-benzyloxycarbonylfortimicin B with trifluoroacetic acid in a methylene chloride solution for 10–30 minutes at room temperature to provide 4-N-glycyl-1,2',6'-tri-N-benzyloxycarbonylfortimicin B trifluoroacetate;

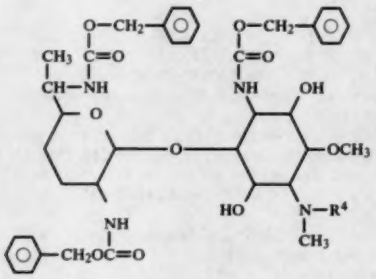
(c) treating said 4-N-glycyl-1,2',6'-tri-N-benzyloxy-carbonylfortimicin B trifluoroacetate with triethylamine and acylating the glycylamino terminus thereof with a reagent of the formula

$R^4—Y$

wherein R^4 is an acyl, N,N-diloweralkylacyl or an acyl group derived from an N-benzyloxycarbonyl protected amino acid or a short peptide, and Y is an activating group selected from the class consisting of



and $—N_3$ is N,N-dimethylformamide or a mixture of tetrahydrofuran and dioxane at a temperature between −10° and 25° C. for 15–48 hours to provide 4-N-acyl-1,2',6'-tri-N-benxyloxycarbonylfortimicin B of the formula



wherein R^4 is as defined above;
and

(d) hydrogenolyzing said benzyloxycarbonyl groups of said 4-N-acyl-1,2',6'-tri-N-benzyloxycarbonylfortimicin B in 0.1 to 0.6 N methanolic hydrochloric acid in the presence of a 2 to 10% palladium on carbon catalyst under 1 to 10 atmospheres of hydrogen gas at a temperature between 10° and 25° C. to form the desired 4-N-acylfortimicin B derivative.

4,174,313
PURIFIED SUNFLOWER SEED PROTEIN ISOLATES

Léon Petit, Sceaux; André Davin, La Chapelle S/Erdre, and Jacques Gueguen, Cachan, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Division of Ser. No. 625,036, Oct. 23, 1975. This application Apr. 6, 1978, Ser. No. 894,092
Claims priority, application France, Oct. 23, 1974, 74 35594
The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **2 Claims**

1. Purified sunflower seed protein isolates obtained from sunflower seed cake containing substances having a mucilaginous consistency by:

(a) making a suspension of such cake with a solution of a calcium salt and a magnesium salt of volume in l. of 10 to 15 times the weight in Kg of press cake which solution further contains sodium sulfite;

(b) adding thereto a concentrated solution of alkali in an amount sufficient to solubilize the proteins in said press cake;
(c) separating the protein extract from the insoluble residue;
(d) acidifying the protein extract obtained with an acid solution at a pH between 4.5 and 5.5 to precipitate the proteins,
(e) separating the protein precipitate from the mother liquor,
(f) washing the protein precipitate and recovering protein isolate,
said protein isolates being weakly pigmented, substantially free from mucilaginous substances and having a nitrogen content of at least 16.0%, and being readily extrudable through extrusion dies without blocking the dies due to the substantial absence of said mucilaginous substances.

4,174,314
DENSITY FRACTIONATION PROCESS TO RECOVER VEGETABLE SEED PROTEINS

Charles M. Garrison, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

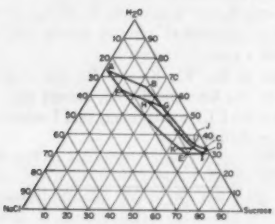
Filed Jul. 7, 1978, Ser. No. 922,922
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **13 Claims**

1. A process for recovering vegetable seed protein granules from comminuted vegetable seed material containing protein granules, comprising:
(1) suspending said comminuted vegetable seed material in a solution comprising an aliphatic polyol, a carbohydrate, and water, said solution having a density of from about 1.0 to about 1.4 g/ml and a water activity of less than about 0.90; and
(2) isolating the vegetable seed protein granules from the balance of the seed materials.

4,174,315
ISOLATION OF PROTEIN FROM VEGETABLE SEED MATERIAL

Charles M. Garrison, Fairfield; Rudolph W. Youngquist, and Harry M. Taylor, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1978, Ser. No. 922,918
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **17 Claims**



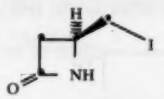
1. A process for recovering vegetable seed protein granules from vegetable seed material, comprising suspending comminuted vegetable seed material having from 0% to about 5% lipid and containing protein granules in an aqueous solution comprising an electrolyte selected from the group consisting of alkali metal halides and alkali metal phosphates and a carbohydrate at a concentration greater than about 1%, said solution having a density of from about 1.2 to about 1.5 g/ml and a water activity of less than about 0.85, and isolating the vegetable seed protein granules from the balance of the vegetable seed material.

4,174,316
4-IODOMETHYLAZETIDIN-2-ONE

Burton G. Christensen, Metuchen; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 14, 1978, Ser. No. 933,323
Int. Cl.[2] C07D *205/08*
U.S. Cl. 260—239 A **1 Claim**

1. A compound having the structure:

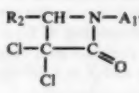


4,174,317
3,3-DICHLORO-2-AZETIDINONE DERIVATIVES

John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 24, 1978, Ser. No. 892,361
Int. Cl.[2] C07D *205/08, 401/06, 403/06, 405/06*
U.S. Cl. 260—239 A **19 Claims**

1. A compound having the formula



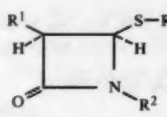
or a pharmaceutically acceptable salt thereof, wherein R_1 is dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, or 4-alkyl-1-piperazinyl; R_2 is phenyl, phenyl monosubstituted with an alkyl, trifluoromethyl or nitro group, phenyl mono-, di- or trisubstituted with halogen or alkoxy groups, 1-naphthyl, 2-naphthyl, or 1,3-benzodioxol-5-yl; A_1 is an alkylene group having 2 to 4 carbon atoms; and wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 6 carbon atoms.

4,174,318
ALKYLATIVE CLEAVAGE OF AZETIDINONE DISULFIDES

Derek H. R. Barton; Peter G. Sammes, both of London; Graham Hewitt, Northolt; Brian E. Looker, Greenford, and William G. E. Underwood, Stoke Poges, all of England, assignors to Glaxo Laboratories Ltd., Great Britain

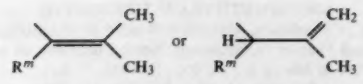
Continuation of Ser. No. 389,663, Aug. 30, 1973, abandoned, which is a division of Ser. No. 167,875, Jul. 30, 1971, abandoned. This application Sep. 22, 1976, Ser. No. 726,425
Claims priority, application United Kingdom, Nov. 3, 1970, 52286/70
Int. Cl.[2] C07D *205/08, 499/00*
U.S. Cl. 260—239 A **9 Claims**

1. A process for the preparation of compounds of formula IV:

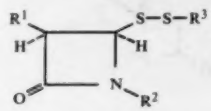


(IV)

wherein R^1 is a phenylacetamido or phenoxyacetamido group; R^2 is a hydrogen atom or a group of formula:

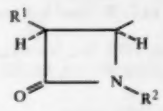


wherein R^m is hydrogen, esterified hydroxyl, etherified hydroxyl, carboxyl or esterified carboxyl; and R^4 is an alkyl group containing 1 to 6 carbon atoms which comprises the step of reacting a compound of formula II:



II

wherein R^1 and R^2 have the above meanings and R^3 is an alkyl group containing 1 to 6 carbon atoms or a group of the formula III wherein R^1 and R^2 are as defined:



III

with a trivalent phosphorus compound of formula $PR^5R^6R^7$ wherein R^5, R^6 and R^7 which may be the same or different are selected from the group consisting of C_{1-6} alkyl and di-C_{1-6} alkylamino groups, in the presence of a reagent R^4X wherein R^4 has the above meaning and X is a halogen atom.

4,174,319

12-ALKYL-1,4,7,10-TETRAAZACYCLOTRIDECANE

Yoshiaki Kobuke, Kyoto, Japan, assignor to Iwao Tabushi, Kyoto, Japan

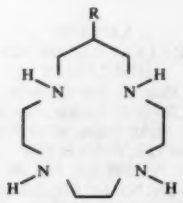
Filed Jan. 23, 1978, Ser. No. 871,349

Claims priority, application Japan, May 19, 1977, 52/57125

Int. Cl.[2] C07D *257/02*

U.S. Cl. 260—239 BC **3 Claims**

1. 12-alkyl-1,4,7,10-tetraazacyclotridecane represented by the formula:



wherein R is a normal alkyl group having from 8 to 20 carbon atoms.

4,174,320

PROCESS FOR THE PREPARATION OF RIFAMPICIN

Tiberio Bruzzese, Milan, Italy, assignor to Holco Investment Inc., Panama

Filed Sep. 27, 1978, Ser. No. 946,530

Claims priority, application United Kingdom, Nov. 25, 1977, 49148/77

Int. Cl.[2] C07D *498/18*

U.S. Cl. 260—239.3 P **15 Claims**

1. A process for the preparation of rifampicin, wherein rifamycin S is reacted in an aprotic dipolar solvent with a 1,3,5-trisubstituted hexahydro-1,3,5-triazine at a temperature from 20° to 100° C. followed by reaction with 1-amino-4-methylpiperazine, while keeping the pH in the range of from 5 to 7, whereafter the rifampicin formed is isolated.

15. 3-(1-Ethyl-3-piperidyl)-1,3-oxazino (5,6-c) rifamycin.

4,174,321

POLYCHROMOPHORIC DIBENZOXAZOLE ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

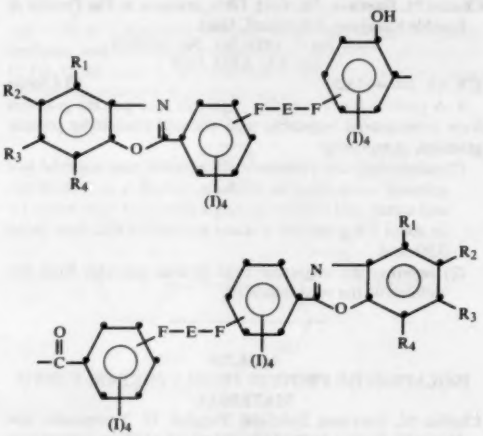
Richard H. S. Wang, and Joseph S. Zannucci, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 502,329, Sep. 3, 1974, abandoned. This application Sep. 1, 1977, Ser. No. 829,752

Int. Cl.[2] C07D *263/62*

U.S. Cl. 548—219 **18 Claims**

1. A compound having the formula:



wherein E is a member selected from the group consisting of an alkylene group, or cycloalkylene group containing 1 to 8 carbon atoms, carbonyl alkylene, alkylene carbonyl and F is oxygen, nitrogen or sulfur;

R_1, R_2, R_3 and R_4 are hydrogen, hydroxy, chloro, bromo, lower alkyl, cycloalkyl, phenyl, lower alkylphenyl, alkoxy, amino, cyano, carboxy;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the FEF substituent, said I substituents can be the same or different.

4,174,322

THIOBIS(OXAZOLINES)

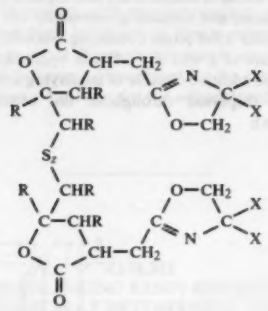
Stanley J. Brois, Westfield, and Antonio Gutierrez, Hamilton Square, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Jul. 20, 1977, Ser. No. 817,217

Int. Cl.[2] C07D *263/08*

U.S. Cl. 548—237 **7 Claims**

1. Oil soluble thio-bis-(hydrocarbyl lactone oxazoline) useful as an additive in oleaginous compositions; derived from alkenyl succinic anhydride, acid or ester; and represented by the formula:



wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 400 carbon atoms; X is selected from the group consisting of C_1 to C_3 alkyl and hydroxy-alkyl of the structure $-(CH_2)_nOH$ wherein n is 1 to 3, at least one of said X being hydroxy alkyl; S represents sulfur and z is an integer ranging from 1 to 4.

4,174,323

1-(2-SULFAMIDOETHYL)-1,4-DIHYDRO-5H-TETRAZOLE-5-THIONE

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 805,197, Jun. 9, 1977, Pat. No. 4,117,123. This application Jul. 3, 1978, Ser. No. 921,681

Int. Cl.[2] **C07D** *257/04*

U.S. Cl. 548—251 **3 Claims**

1. 1-(2-Sulfamidoethyl)-1,4-dihydro-5H-tetrazole-5-thione and its alkal metal and ammonium salts.

4,174,324

3-(CARBOXYMETHYL)THIO-1H-1,2,4-TRIAZOL-5-THIONE

David A. Berges, Wayne, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 811,642, Jun. 30, 1977, Pat. No. 4,117,124. This application Jul. 3, 1978, Ser. No. 921,922

Int. Cl.[2] **C07D** *249/12*

U.S. Cl. 548—264 **3 Claims**

1. [(4,5-Dihydro-5-thioxo-1H-1,2,4-triazol-3-yl)thio]acetic acid and its alkali metal and ammonium salts.

4,174,325

THERMOPLASTIC ABS MOULDING COMPOSITIONS WITH IMPROVED IMPACT STRENGTH

Alfred Pischtschan, Kürten; Siegfried Adelmann, and Dieter Margotte, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,531

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704679

Int. Cl.[2] **C08K** *5/10*

U.S. Cl. 260—32.1 N **2 Claims**

1. Thermoplastic ABS moulding compositions containing 0.1–10% by weight of at least one ester of a saturated aliphatic monocarboxylic acid with 10–22 C-atoms with a hydroxy compound selected from the group consisting of stearyl alcohol, ethylene glycol, glycerine, trimethylol propane, hexanetriol, erythritol, mannitol, sorbitol, pentaerythritol, bisphenol-A, hydroquinone, and phloroglucinol.

4,174,326

IMIDYL COMPOUNDS

Marcus Baumann, Basel; Vratislav Kvita, Muttenz; Martin Roth, Basel, all of Switzerland, and John S. Waterhouse, Cherry Hinton, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

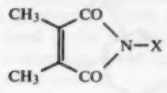
Division of Ser. No. 696,346, Jun. 15, 1976, Pat. No. 4,107,174. This application Apr. 21, 1978, Ser. No. 898,757

Claims priority, application Switzerland, Jun. 18, 1975, 07951/75; Nov. 27, 1975, 15390/75

Int. Cl.[2] **C09D** *207/44;* **C07D** *209/48*

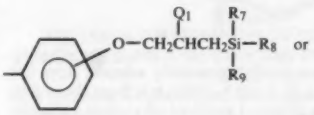
U.S. Cl. 260—326 E **4 Claims**

1. A compound of the formula

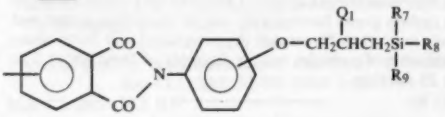


wherein

X is the group



or

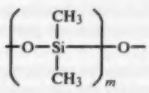


where

Q_1 is hydrogen or methyl,

R_7 and R_8 independently of each other represent hydrogen, OH, chlorine, alkoxy of 1 to 8 carbon atoms, phenoxy, —OCO-alkyl with alkyl of 1 to 8 carbon atoms, —OCO-phenyl, —NH-alkyl with 1 to 8 carbon atoms, or $N(alkyl)_2$ with alkyl of 1 to 8 carbon atoms, and

R_9 represents vinyl, methyl, phenyl, the group $-O-Si(CH_3)_3$, or has the same meaning as R_7 or R_8, or R_7 and R_8 conjointly form the group



where m denotes a number 2, 3 or 4.

4,174,327

SPIRANE DERIVATIVES

Walter Renold, Onex; Werner Skorianetz, Geneva; Karl-Heinrich Schulte-Elte, Onex, and Gunther Ohloff, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 728,644, Oct. 1, 1976, Pat. No. 4,120,830, which is a continuation-in-part of Ser. No. 625,452, Oct. 23, 1975, Pat. No. 4,014,905, which is a continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Jul. 5, 1978, Ser. No. 922,189

Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; Jun. 7, 1974, 7776/74; Jul. 30, 1975, 9920/75

Int. Cl.[2] **C07D** *307/94*

U.S. Cl. 260—346.11 **4 Claims**

1. 6,7-Epoxy-2,6,10,10-tetramethyl-1-oxa-spiro [4.5]decane.

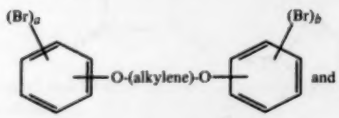
4. 2,6,9,10,10-pentamethyl-6,7-epoxy-1-oxa-spiro [4.5]decane.

4,174,328
FLAME RETARDED NON-WOVEN TEXTILE MATERIAL COMPRISED OF FLAME RETARDANT AND VINYL CHLORIDE LATEX

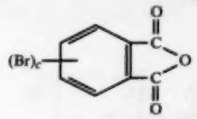
Ray E. Smith, and Jayendra G. Shukla, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 16, 1978, Ser. No. 934,123
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 CL **8 Claims**

1. A flame-retarded non-woven material comprising a mixture of flame retardant and vinyl chloride latex, wherein said flame retardant is selected from the group consisting of



I



II

wherein a and b are integers independently selected from the group consisting of 1, 2, 3, 4 and 5, a plus b is from about 6 to about 10, c is an integer of from 1 to 4, and alkylene is a straight chain carbon group having from one to six carbon atoms; and wherein more than 50 percent (by weight) of said flame retardant consists of particles with a diameter of from about 2 to about 25 microns.

4,174,329
ALKYD RESINS MODIFIED WITH TETRAFLUOROETHYLENE ADDUCT OF CONJUGATED TRIGLYCERIDES

Edward W. Bell, Peoria, and Lyle E. Gast, Harvard, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 26, 1978, Ser. No. 918,892
Int. Cl.[2] C09D *3/34, 3/64*
U.S. Cl. 260—22 XA **7 Claims**

1. A composition comprising the cycloaddition reaction product of a triglyceride oil having sets of conjugated double bonds and a sufficient amount of tetrafluoroethylene with respect to said sets of conjugated double bonds whereby cycloaddition of tetrafluoroethylene in said composition is present at least at substantially each of said sets.

4. An alkyd resin composition comprising the reaction product of (1) glycerol, (2) an anhydride, and (3) the cycloaddition reaction product of tetrafluoroethylene and a conjugated triglyceride oil.

4,174,330
PROCESS FOR DISPERSING ADDITIVES IN THERMOPLASTIC POLYMERS

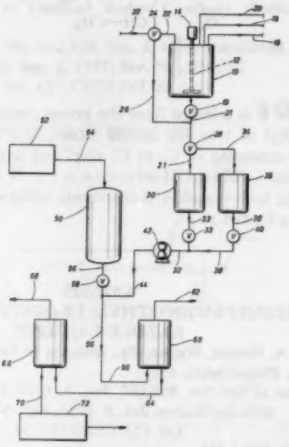
Ronald E. Gilbert, Katy; Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, all of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 835,269, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,531
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 A **16 Claims**

1. In a process in which an additive is incorporated into and dispersed in a thermoplastic polymer by comalaxation at a temperature above the softening temperature of the polymer; the improvement which consists essentially of admixing with said thermoplastic polymer a Bingham fluid composition and comalaxating said mixture, said Bingham fluid composition being a solid at ambient temperature and capable of flow under an applied pressure and consisting essentially of:

(a) a continuous solid phase consisting essentially of an intimate mixture of a wax and a liquid hydrocarbon, and

(b) at least one additive capable of modifying a solid polymer uniformly dispersed throughout the continuous solid phase of (a);



the wax employed in the continuous solid phase of the Bingham fluid composition being characterized in that:

(c) at least 30 parts of the wax will dissolve in 100 parts of n-heptane at 80° C.,

(d) a solution prepared per (d), when cooled to 20° C., forms a continuous solid phase, and

(e) the continuous phase prepared per (e) will flow when subjected to a shear stress of 50 sec^{-1}.

4,174,331
REFRACTORY MOLDABLE COMPOSITION CONTAINING CERAMIC FIBER AND COLLOIDAL SILICA

Thomas A. Myles, Tonawanda, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 475,214, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 265,945, Jun. 23, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,475
Int. Cl.[2] C08L *1/04, 33/24, 1/10, 71/02*
U.S. Cl. 260—29.1 R **15 Claims**

1. A refractory moldable composition consisting essentially of:

(a) from about 45 to about 65% by weight liquid vehicle;

(b) from about 21 to about 26% by weight ceramic fiber;

(c) from about 7 to about 30% by weight colloidal silica; and

(d) sufficient adhesion enhancing agent selected from the group consisting of solid acrylic polymer prepared from acrylamide; polyethylene oxide; hydroxyethylcellulose; carboxymethylcellulose; and mixtures thereof, to impart an adherence value to steel, measured by casting the com-

position into a cylindrical mold having a three-inch diameter and a one-inch height, and placing a steel plate horizontally in contact with the composition, and measuring the vertical force necessary to obtain separation, of from about 18 to about 50 grams per square centimeter;

the liquid vehicle being a non-solvent for the ceramic fiber and colloidal silica and a solvent for the adhesion enhancing agent.

4,174,332

SELF-CROSSLINKING RESIN EMULSIONS FOR CATHODICALLY DEPOSITABLE COATING COMPOSITIONS

Helmut Honig, and Georgios Pampouchidis, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Feb. 2, 1978, Ser. No. 874,565

Claims priority, application Austria, Feb. 7, 1977, 758/77; Dec. 15, 1977, 8955/77

Int. Cl.[2] **C08L** *63/00*

U.S. Cl. 260—29.2 TN **9 Claims**

1. Emulsions of binders which are cathodically depositable in an electrodeposition system comprising (A) 98 to 50 percent by weight of a water-soluble self-crosslinking cationic resin water-dilutable upon partial or total neutralization with an inorganic or organic acid, said resin containing on an average at least 0.5 basic nitrogen atoms in 1000 molecular weight units and a double bond number of at least 0.5; and (B) 2 to 50 percent by weight of a water-insoluble self-crosslinking polymeric resin having a double bond number of at least 0.8.

4,174,333

CARBOXYLATED AMIDE POLYMERS AND COATING COMPOSITIONS CONTAINING SAME

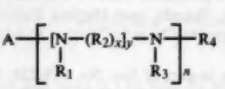
Marvis E. Hartman, Pittsburgh, and Thomas R. Hockswender, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1978, Ser. No. 957,118

Int. Cl.[2] **C08G** *59/14;* **C08L** *63/00*

U.S. Cl. 260—29.2 EP **37 Claims**

1. A carboxylated amide polymer, said polymer being the reaction product of (1) a compound having the formula



wherein A is the organic residue resulting from a ring opening reaction of a 1,2-epoxy group on a polyepoxide with ammonia or amine, R_1 is hydrogen or a C_{1-4} alkyl group, R_2 is a C_{2-12} alkylene group, x is 0 or 1, y is from 0 to 4, R_3 is hydrogen or a C_{1-6} alkyl group, R_4 is hydrogen or a C_{1-6} alkyl group, provided at least one R_1, R_3 and R_4 group is hydrogen and n is greater than 1.0 with (2) a cyclic anhydride of a dicarboxylic acid.

4,174,334

SURGICAL CEMENT COMPOSITIONS CONTAINING ALUMINO BORATE GLASS AND A POLYMER GLASS AND A POLYMER CONTAINING RECURRING CARBOXYLIC OR CARBOXYLATE GROUPS

Barry W. Bertenshaw; Edward C. Combe; David C. Tidy, all of Manchester, and John N. C. Laycock, Runcorn, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 7, 1977, Ser. No. 849,360

Claims priority, application United Kingdom, Nov. 12, 1976, 47211/76

Int. Cl.[2] **C08L** *33/00*

U.S. Cl. 260—29.6 M **15 Claims**

1. A cement composition comprising:

(i) an alumino borate glass in powdered form containing fused oxides of aluminum, boron and a third oxide type comprising at least one alkali metal or alkaline earth metal oxide and

(ii) a water soluble organic polymer comprising a polymer chain that contains recurring carboxylic acid or carboxylate ion groups.

4,174,335

AQUEOUS DISPERSIONS OF OLEFINIC RESIN COMPOSITIONS AND PROCESS FOR PREPARATION THEREOF

Akio Ohdaira, Iwakuni; Toru Tomoshige, and Kinich Onodera, both of Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 20, 1976, Ser. No. 707,084

Claims priority, application Japan, Jul. 22, 1975, 50-88857

Int. Cl.[2] **C08L** *23/08;* **C08J** *3/04*

U.S. Cl. 260—29.6 RW **15 Claims**

1. In a process for producing an aqueous dispersion of an olefinic resin composition the particles of which are composed of a major proportion of carboxyl-free olefinic resin and a minor proportion of carboxyl-containing modified olefinic resin which comprises mixing an olefinic resin composition composed of a carboxyl-free olefin resin selected from the group consisting of homo- and co-polymers of 1-olefinic unsaturated hydrocarbons containing 2 to 6 carbon atoms, copolymers of said hydrocarbons with dienes, copolymers of said hydrocarbons with vinyl acetate, saponified products of copolymers of said hydrocarbons with vinyl acetate, graft copolymers of dienes with said homo- or co-polymers of said hydrocarbons, saponified products of said graft copolymers and blends of these resins having an intrinsic viscosity of not more than 20 and a carboxyl-containing modified olefinic resin selected from the group consisting of copolymers of 1-olefinic unsaturated hydrocarbon containing 2 to 6 carbon atoms with α,β-unsaturated carboxylic acids, saponified products of copolymers of said hydrocarbons with the functional derivatives α,β-unsaturated carboxylic acids, graft copolymers of homo- or co-polymers of said hydrocarbons with α,β-unsaturated carboxylic acids, saponified products of graft copolymers of homo- or co-polymers of said hydrocarbons with the functional derivatives of α,β-unsaturated carboxylic acids and blends of these resins having an acid number of at least 10 and an intrinsic viscosity of at least 0.04 with an aqueous medium in the presence of a base at an elevated temperature; the improvement wherein an olefinic resin composition comprising (a) 50 to 99% by weight of a carboxyl-free olefinic resin having an intrinsic viscosity of 0.01 to 5 and (b) 1 to 50% by weight of a carboxyl-containing modified olefinic resin having an intrinsic viscosity of 0.04 to 1 and an acid number of 30 to 150, the amount of each resin being based on the total amount of said resins (a) and (b), which has been melted by heating to a temperature above the melting point, whichever is higher, of said resins, is mixed with the aqueous medium heated to a temperature of 140 to 300° C in the presence of at least 0.2 chemical equivalent, to the carboxyl groups of said resin (b), of the base.

4,174,336

AQUEOUS HEAT CURABLE PARTICULATE COATING COMPOSITION OF ELASTOMERIC EMULSION COPOLYMER AND THERMOSETTING COPOLYMER

Howard H. Leiner, Southfield, Mich.; Lee E. Koepke, Wayzata, Minn.; Dennis R. Gelarden, Livonia; John L. Gardon, Birmingham, both of Mich., assignors to M & T Chemicals, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 755,647, Dec. 30, 1976, abandoned. This Application Jun. 15, 1978, Ser. No. 915,734

Int. Cl. C08L *31/02*

U.S. Cl. 260—29.7 UP 11 Claims

1. A heat-curable coating composition consisting essentially of an aqueous medium containing dispersed polymer particles which, in turn, consist essentially of an elastomeric emulsion copolymer A and a thermosetting copolymer B, wherein

(1) copolymer B is prepared in the presence of preformed copolymer A.

(2) the rate of addition of the constituent monomers of copolymer B is substantially equal to the reaction rate of said monomers to form copolymer B.

(3) copolymer B constitutes from 10 to 70% of the combined weight of copolymers A and B, exhibits a glass transition temperature from 40° to 75° C.,

(4) the repeating units of copolymer B are derived from

(a) at least one monoethylenically unsaturated compound containing from 2 to 20 carbon atoms,

(b) from 2 to 20%, based on the weight of copolymer B, of at least one monoester of a diol containing from 2 to 4 carbon atoms and acrylic or methacrylic acid, said monoester being copolymerizable with said monoethylenically unsaturated compound, and

(c) from 5 to 40%, based on the weight of copolymer B, of at least one latent curing agent selected from the group consisting of N-alkoxymethyl acrylamides and N-alkoxymethyl methacrylamides wherein the alkoxy group contains from 1 to 8 carbon atoms,

(5) copolymer A exhibits a glass transition temperature of from −15° to +25° C., .

(6) the repeating units of copolymer A are derived from

(a) at least two monoethylenically unsaturated compounds containing from 2 to 20 carbon atoms, and

(b) from about 0.5 to 5.0%, based on the weight of copolymer A, of a polyfunctional compound selected from the group consisting of diesters and triesters derived from acrylic or methacrylic acid and a diol containing from 2 to 8 carbon atoms or a triol containing from 3 to 8 carbon atoms, divinyl benzene and allyl methacrylate.

4,174,337

HYDROXY-FUNCTIONAL ESTERS OF SUBSTITUTED IMIDAZOLIDINEDIONES AND COMPOSITIONS CONTAINING SAME

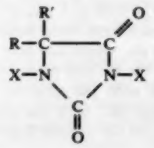
William J. Birkmeyer, Oakmont; J. Alden Erikson, Gibsonia, and Ronald J. Lewarchik, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1978, Ser. No. 950,096

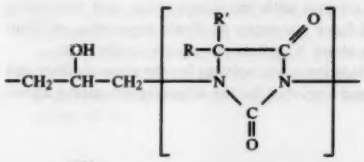
Int. Cl.[2] C08K *5/06*

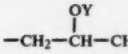
U.S. Cl. 260—31.4 R 34 Claims

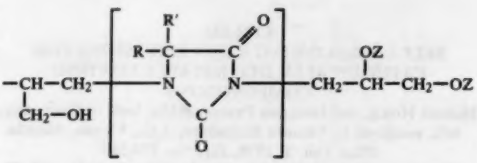
1. A hydroxy-functional ester of a substituted imidazolidinedione having the formula:



where X is hydrogen,







provided both X's are not hydrogen, with R and R′ being independently hydrogen or hydrocarbon groups having 1 to 8 carbon atoms, with one Y being hydrogen, one Z being hydrogen and the other Y and Z being

where the R″ groups are independently hydrocarbon groups having from 1 to 17 carbon atoms.

4,174,338

PASTY COMPOSITIONS FOR CROSSLINKING ORGANOPOLYSILOXANES TO SILICONE RUBBER

Heinz Goller, Bergisch-Gladbach; Hans-Hermann Schulz, Leichlingen, and Bernhard Leusner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,340

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644193

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB 5 Claims

1. A pasty composition for the room temperature crosslinking and curing of a vulcanizable organopolysiloxane, comprising a crosslinking agent for an organopolysiloxane, a curing catalyst therefor, and about 3–40% by weight of the total amount of the pasty composition of active hydrophilic silicic acid as a thickener.

4,174,339

ANTI-FOULING PAINT COMPOSITION

Sumio Matsuda, Ibaraki, and Hajime Kudara, Shiga, both of Japan, assignors to Chugoku Marine Paints Ltd., Hiroshima, Japan

Continuation-in-part of Ser. No. 855,231, Nov. 18, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,860

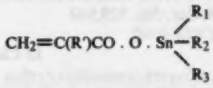
Int. Cl.[2] C08K *3/00*

U.S. Cl. 260—40 R 7 Claims

1. An anti-fouling paint composition, which comprises 20% to 60% by weight of at least one pigment and 20% to 60% by weight of a reaction product prepared by the esterification of a copolymer (a), defined below, with a copolymer (b) defined below, said reaction product having an esterification degree of at least 60%;

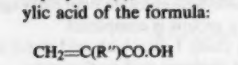
the copolymer (a) being comprised of 60% to 90% by weight, based on the weight of the copolymer (a), of units

derived from at least one trialkyl-tin carboxylate of the formula:



(I)

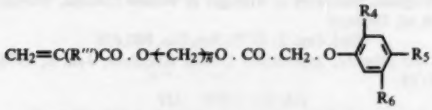
wherein R' is hydrogen or a methyl group, and R_1, R_2 and R_3 are the same or different and selected from alkyl groups having 1 to 8 carbon atoms and a phenyl group, and 10% to 40% by weight, based on the weight of the copolymer (a), of units derived from at least one carboxylic acid of the formula:



(II)

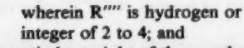
wherein R'' is hydrogen or a methyl group;

the copolymer (b) being comprised of 30% to 80% by weight, based on the weight of the copolymer (b), of units derived from at least one phenoxyaceticalkyl carboxylate of the formula:



(III)

wherein R''' is hydrogen or a methyl group, n is an integer of 2 to 4, R_4 is chlorine or an alkyl group having 1 to 4 carbon atoms, R_5 is chlorine or bromine and R_6 is hydrogen, chlorine or bromine, and 20% to 70% by weight, based on the weight of the copolymer (b), of units derived from at least one hydroxyalkyl carboxylate of the formula:



(IV)

wherein R'''' is hydrogen or a methyl group, and n is an integer of 2 to 4; and

the ratio by weight of the copolymer (a) to the copolymer (b) being 40 to 95:5 to 60.

4,174,340

PLASTIC MOLDING COMPOSITION CONTAINING A FILLER

Walter Lüders, Neu-Isenburg; Walter Herwig, Bad Soden am Taunus; Ulrich van Spankeren, Hofheim am Taunus, and Karlheinz Burg, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,397

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735160

Int. Cl.[2] **C08K** *3/26, 5/53, 9/04*

U.S. Cl. 260—42.14 **3 Claims**

1. Plastic molding composition containing a filler, which composition consists of

from 20 to 90 parts by weight of a polyolefin,

from 10 to 80 parts by weight of an alkaline earth metal carbonate,

common additives and from 0.1 to 10% by weight, calculated on the filler, of an adhesion promoter, said adhesion promoter comprising an organo-phosphorus compound of the formula

(I)

in which R^1 is an alkyl radical having from 1 to 18 carbon atoms, an alkenyl radical of from 2 to 18 carbon atoms, an aralkyl radical of from 7 to 13 carbon atoms, whose alkyl chain has from 1 to 3 carbon atoms, or an aralkenyl radical of from 8 to 13 carbon atoms, whose alkenyl chain has 2 or 3 carbon atoms, and R^2 and R^3, which are identical or different, represent hydrogen, an alkyl radical of from 1 to 8 carbon atoms, an aryl radical of from 6 to 10 carbon atoms, an aralkyl radical of from 7 to 13 carbon atoms, whose alkyl chain has from 1 to 3 carbon atoms, or an alkenyl radical of from 3 to 5 carbon atoms.

4,174,341

UNCURED CHLORINATED POLYETHYLENE COMPOSITION WITH HEXAMETHYLPHOSPHORIC TRIAMIDE AND MERCAPTOTRIAZINE

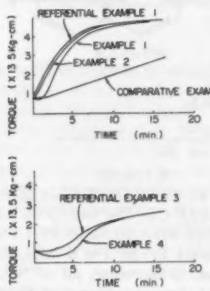
Yasuo Matoba, Suita; Yoshio Kise; Nobuo Yamada, both of Amagasaki; Akira Hashimoto, Itami, and Tetsuya Nakata, Ibaraki, all of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

Filed May 5, 1976, Ser. No. 683,678

Claims priority, application Japan, Dec. 19, 1975, 50-152393

Int. Cl.[2] **C08F** *114/04;* **C08C** *19/20, 19/22*

U.S. Cl. 260—45.7 S **4 Claims**

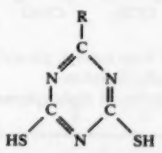


1. A curable chlorinated polyethylene composition comprising:

(A) chlorinated polyethylene,

(B) a complex formed between hexamethylphosphoric triamide and a member selected from the group consisting of carboxylic acids, cyanuric acid, unsubstituted phenols, phenols substituted with alkyl of 1 to 8 carbon atoms, hydroxyl, halogen, lower alkoxy or formyl, alcohols and metal salts, and

(C) a mercaptotriazine of the formula



wherein R is a member selected from the group consisting of a mercapto group, alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, dialkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms, cycloalkylamino groups with the cycloalkyl moiety containing 6 to 8 carbon atoms, dicycloalkylamino groups with the alkyl moiety containing 6 to 8 carbon atoms, arylamino groups, N-aryl-N-alkylamino groups with the alkyl moiety containing 1 to 8 carbon atoms and alkoxy groups containing 1 to 8 carbon atoms.

4,174,342

N-(ACENAPHTHENYL)MALEIMIDES

Jorge P. Li, Libertyville, and Frank C. Becker, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

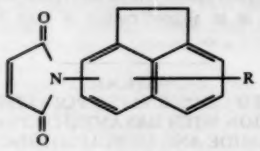
Filed Mar. 27, 1978, Ser. No. 890,736

Int. Cl.[2] **C07D** *207/40;* **A61K** *31/40;* **C08L** *33/00*

U.S. Cl. 260—45.8 N **10 Claims**

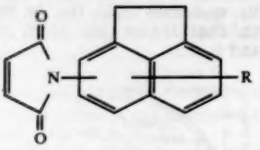
1. A plastic, cellulosic or other film-forming composition

resistant to fungal attack comprising said plastic cellulosic or film-forming composition and between 0.005 and 5.0% by weight of an acenaphthene derivative of the formula



wherein R is H or NO_2.

6. A compound of the formula



wherein R is H or NO_2.

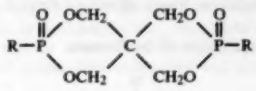
4,174,343

PENTAERYTHRITYL DIPHOSPHONATE-AMMONIUM POLYPHOSPHATE COMBINATIONS AS FLAME RETARDANTS FOR OLEFIN POLYMERS

William B. Hardy, Bound Brook; Tae B. Min, Piscataway, and Joseph A. Hoffman, Bridgewater, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 5, 1978, Ser. No. 903,294
Int. Cl.[2] C07C *121/00*; C08K *3/32, 5/53*
U.S. Cl. 260—45.75 B 17 Claims

1. A self-extinguishing, non-dripping composition comprising a polyolefin and a self-extinguishing, non-dripping amount of a combination of (A) a compound having the formula



wherein R is selected from methyl, phenyl, benzyl and cyano, and (B) ammonium polyphosphate.

17. Dicyanopentaerythrityl diphosphonate.

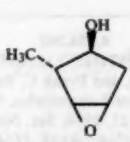
4,174,344

PROCESS FOR THE PREPARATION OF METHYL 3,4-ANHYDRO-2,6-DIDEOXY-L-RIBO-HEXOPYRANOSIDE

Guenter Grethe, North Caldwell; Milan R. Uskokovic, Upper Montclair, and John Sereno, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 14, 1977, Ser. No. 850,982
Int. Cl.[2] C07D *301/00*
U.S. Cl. 260—348.55 2 Claims

1. A compound of the formula



its enantiomer and racemate thereof.

4,174,345

SYNTHESIS OF STEROIDS

Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

Filed Aug. 1, 1978, Ser. No. 929,932
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.1 12 Claims

1. In a process wherein a methoxyethoxymethoxy ether of a 3β-hydroxy steroid is treated with zinc bromide to cleave methoxyethoxymethoxy groups therefrom, the step of bringing zinc bromide into contact with said sterol and a solution of methylene chloride and an aliphatic alcohol having one to six carbons, said alcohol being in any appreciable amount up to about 5% by volume of said methylene chloride until cleavage of said methoxyethoxymethoxy groups is completed.

11. A process as set forth in claim 1, in which said sterol is 3β-(methoxyethoxymethoxy)-5-cholenic acid methyl ester.

4,174,346

PROCESS FOR PREPARING ORGANOTIN COMPOUNDS

John D. Collins, Albrighton, and Donald A. Wood, Warley, both of England, assignors to Albright & Wilson Limited, Warley, both of, England

Filed Jun. 2, 1977, Ser. No. 802,626
Claims priority, application United Kingdom, Jun. 8, 1976, 23666/76
Int. Cl.[2] C07F *7/22*
U.S. Cl. 260—429.7 41 Claims

1. A process for preparing a tricycloalkyltin compound, which comprises reacting at a temperature of between 110° C. and 180° C.

an organotricycloalkyltin of formula $RSnR_3''$, wherein R'' is a cycloalkyl group selected from the group consisting of cyclohexyl and cyclohexyl substituted by at least one inert substituent, and R is a radical selected from the group consisting of alkyl, alkenyl, aralkyl and aryl groups,

with an organotin trichloride of formula $R'SnCl_3$, wherein R' is an organic group,

the molar ratio of said organotricycloalkyltin to said organotin trichloride being between 0.8:1 and 1:1.2,

to form a mixture comprising tricycloalkyltin chloride and a diorganotin dichloride.

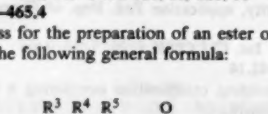
4,174,347

PREPARATION OF ESTERS

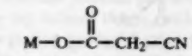
Helena Austermühle-Bertola, Amsterdam, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Jun. 19, 1978, Ser. No. 916,590
Int. Cl.[2] C07C *120/00, 121/00*
U.S. Cl. 260—465.4 8 Claims

1. A process for the preparation of an ester of cyanoacetic acid having the following general formula:

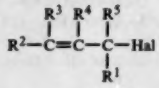


wherein R^1, R^2, R^3, R^4 and R^5 each independently represent a hydrogen atom, an alkyl group of one to four carbon atoms, or a cycloalkyl group, which comprises mixing and reacting an alkali metal carboxylate of general formula:

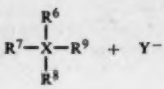


(II)

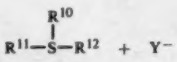
wherein M represents an alkali metal atom, with a hydrocarbyl halide of general formula:



wherein R^1, R^2, R^3, R^4 and R^5 are as defined above and Hal is a halogen atom having an atomic number of at least 17, in the presence of a phase transfer catalyst selected from the group consisting of a quaternary onium salt of the general formula



wherein X represents a nitrogen, phosphorus or arsenic atom, R^6, R^7, R^8 and R^9 represent, independently, an alkyl group containing 1 to 18 carbon atoms or an aralkyl or aryl group containing up to 10 carbon atoms, and Y represents a monovalent ion; a ternary sulphonium salt of the general formula



wherein R^{10}, R^{11} and R^{12} each, independently, represents an alkyl group containing 1 to 18 carbon atoms and Y represents a monovalent ion; a macrocyclic polyether selected from the group consisting of 1,4,7,10,13,16-hexaoxacyclooctadecane, 3,4-benzo-1,6,9,12,15,18,21-heptaoxacyclotricos-3-ene and 3,4-benzo-1,6,9,12-tetraoxycyclotetradec-3,-ene; and in the presence of an organic solvent for the hydrocarbyl halide, at a temperature in the range of from about 20° C. to about 100° C.

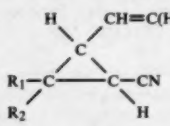
4,174,348

PREPARATION OF CYCLOPROPANECARBONITRILES

Petrus A. Kramer, and Helena Austermühle-Bertola, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij B. V., Netherlands

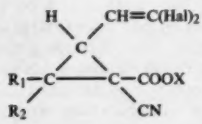
Filed May 30, 1978, Ser. No. 910,882
Int. Cl.[2] C07C *121/46*
U.S. Cl. 260—464 **7 Claims**

1. A process for the preparation of a cyclopropanecarbonitrile of the general formula:



(I)

wherein R_1 and R_1 each individually represent an alkyl group of from one to six carbon atoms and Hal represents a fluorine, chlorine or bromine atom; which comprises heating, in the presence of a polar aprotic solvent, a cyclopropanecarboxylate of the general formula:



(II)

wherein R_1, R_2 and Hal in general formula II have the same meanings as in general formula I and X represents a quaternary ammonium group.

4,174,349

PREPARATION OF FLUOROORGANIC COMPOUNDS WITH CALCIUM FLUORIDE

Francis E. Evans, Hamburg, N.Y.; Morris B. Berenbaum, Summit, N.J.; Richard E. Eibeck, Orchard Park, and Martin A. Robinson, East Amherst, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 30, 1978, Ser. No. 955,679
Int. Cl.[2] C07C *17/10, 17/12, 17/14, 51/58*
U.S. Cl. 260—544 F **25 Claims**

1. The method which comprises reacting a haloorganic starting material in which at least one halo atom is replaceable with a fluorine atom by metathetical exchange, with calcium fluoride in the presence of a cage compound and an anhydrous polar, basic organic solvent which contains no —OH groups and which solubilizes the cage compound, starting material and calcium fluoride, at a temperature and for a period of time adequate to effect fluorination.

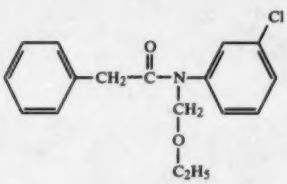
4,174,350

HERBICIDAL ACTIVE CARBOXANILIDE DERIVATIVES

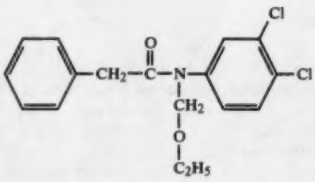
Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 655,651, Feb. 6, 1976, Pat. No. 4,088,687, which is a division of Ser. No. 539,200, Jan. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 449,782, Mar. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,242, May 14, 1973, abandoned. This application Feb. 21, 1978, Ser. No. 879,174
Int. Cl.[2] C07C *103/76;* A01N *9/20*
U.S. Cl. 260—558 P **2 Claims**

1. The compound



2. The compound



4,174,351

SEPARATION OF DISSIMILAR AMINES

James P. Shoffner, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 28, 1978, Ser. No. 937,616
Int. Cl.[2] C07C *85/26, 89/04*
U.S. Cl. 260—582 **10 Claims**

1. A process for the separation of dissimilar amines which comprises treating a mixture containing said dissimilar amines with a reactive carbonyl compound and an acid at reaction conditions, and recovering the separated amines.

4,174,352
PROCESS FOR AQUEOUS CHROMATE ION OXIDATION OF ALLYLIC HALIDES AND HALOMETHYLATED AROMATICS TO ALLYLIC AND AROMATIC ALDEHYDES

Thomas H. Fisher, and William Dowd, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1978, Ser. No. 903,425
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—599 **5 Claims**

1. An improved process for preparing an aldehyde of the formula

$$A\text{-}(CHO)_n \quad (I)$$

wherein A is an allylic, aryl or an inertly-substituted allylic or aryl radical and n is an integer of at least 1, the process comprising contacting in a basic, liquid, biphasic mixture and at reactive conditions a compound of the formula

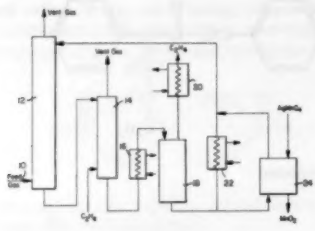
$$A\text{-}(CH_2X)_n \quad (II)$$

wherein X is chloride, bromide or iodide and A and n are as previously defined, with divalent chromate ion, the improvement comprising contacting II with the chromate ion in the presence of a catalytic amount of a quaternary ammonium and/or phosphonium salt.

4,174,353
OLEFIN SEPARATION PROCESS

Arthur E. Marcinkowsky, Charleston; George E. Keller, II, South Charleston, and Surendra K. Verma, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,420
Int. Cl.[2] C07C *7/01*
U.S. Cl. 585—835 **9 Claims**



1. The process for the separation of ethylene or propylene from a purified, multi-component gas stream produced from the thermal cracking of hydrocarbons and containing ethylene or propylene and other low molecular weight components comprising the steps of:

(a) introducing, said multi-component gas stream into an aqueous silver salt solution stream to effect the absorption and/or complexing of the contained ethylene or propylene and reaction of trace acetylenes with the silver metal ions of such solution;

(b) venting of the silver salt solution stream at reduced pressure to remove the dissolved other low molecular weight components;

(c) treating the resulting silver salt solution stream to separate the absorbed and/or complexed ethylene or propylene from the silver salt stream;

(d) further treating the resultant silver salt solution stream to release the contained trace acetylenes therefrom and provide an aqueous silver salt stream; and

(e) recycling said aqueous silver salt stream to said introducing step.

4,174,354
OXIDATIVE DEHYDROGENATION USING CHROMIUM-CONTAINING CATALYSTS

Robert K. Grasselli, Chagrin Falls; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to Standard Oil Company (Ohio), Ohio

Division of Ser. No. 393,732, Sep. 4, 1973, Pat. No. 3,956,181. This application Dec. 18, 1974, Ser. No. 532,097
Int. Cl.[2] C07C *11/12*
U.S. Cl. 585—626 **6 Claims**

1. In the process for the oxidative dehydrogenation of an olefin containing 4 to about 10 carbon atoms to its corresponding diolefin by contacting the olefin with molecular oxygen at a temperature of about 200° C. to about 600° C. in the presence of a catalyst, the improvement comprising

using as the catalyst the catatalyst of the formula

$$A_a D_b Ni_c Co_d Cr_e Bi_f Mo_{12} O_x$$

wherein

A is an alkali metal, Tl, In, Ag, Cu, rare earth metal or mixture thereof; and

D is P, As, Sb, Sn, Ge, B, W, Th, V, Ti, Si or mixture thereof;

and wherein

a and b are 0–4;

c and d are 0 to 20 with c+d greater than or equal to 0.1;

e is 0.1 to about 10;

f is about 0.01 to 6; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,174,355
PROCESS FOR REMOVING α-ACETYLENES FROM DIOLEFINS

Pradeep V. Patel, Parma Heights, and Donald E. Murphy, Gates Mills, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 770,284, Feb. 22, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,641
Int. Cl.[2] C07C *7/00*
U.S. Cl. 585—843 **10 Claims**

1. A process for removing alpha-acetylenes from a hydrocarbon vapor mixture comprising said alpha-acetylenes and a conjugated diolefin having four to five carbon atoms, which process comprises, (a) introducing only said hydrocarbon vapor mixture optionally with an inert gaseous diluent, to a fixed bed reactor without supplying hydrogen or oxygen thereto, (b) contacting said mixture at a temperature in the range from about 300° F. to about 360° F. with a solid porous supported catalyst selected from the group consisting essentially of supported cupric oxide and silver oxide in the range from more than 10% but less than 25% by weight of said catalyst, at a gas hourly space volocity (GHSV) in the range from about 100 to about 1500, (c) cracking said alpha-acetylenes to non-oxygenated organic compounds so as to produce at least 90 percent conversion of said alpha-acetylenes in the effluent from said reactor, in which effluent cyclopentadiene, if present in the feed, is essentially unconverted, with loss of diolefin to less than 1 percent by weight of the hydrocarbon feed, and (d) providing heat to said reactor so as to maintain said temperature range during said process.

4,174,356
SYNTHETIC AMORPHOUS SILICA PARAFFIN HYDROGENATION-DEHYDROGENATION

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 738,789, Nov. 4, 1976, Pat. No. 4,086,261, which is a continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application Feb. 10, 1978, Ser. No. 876,813

Int. Cl.[2] C07C *5/36*

U.S. Cl. 585—661 **22 Claims**

1. A hydrogenation-dehydrogenation process wherein a paraffin of from 2 to about 30 carbon atoms is subjected to hydrogenation-dehydrogenation conditions in the presence of a catalytic amount of a solid containing, at least in part, a synthetic amorphous solid prepared by the steps of hydrolyzing and polymerizing in the presence of water a silane having the formula $R(Si)X_3$, wherein R is a nonhydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of

$$-\text{si}\lessgtr \text{ and } -\text{Si(R)}_2-\text{O}-\text{Si}\lessgtr,$$

and calcining the polymerized product, said silane being admixed with a second compound, R'_nMY_m, wherein R' is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is at least one member selected from the group consisting of the elements of Groups IIIA, IVA, VA, IVB, VB, VIB and VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8.

4,174,357
ALKYLATION PROCESS

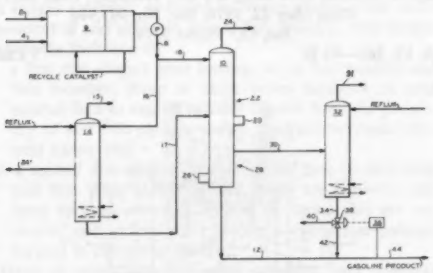
Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Continuation of Ser. No. 462,877, Apr. 22, 1974, Pat. No. 3,957,901, which is a continuation-in-part of Ser. No. 276,096, Jul. 28, 1972, abandoned. This application Feb. 2, 1976, Ser. No. 654,434

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.[2] C07C *3/52*

U.S. Cl. 585—701 **2 Claims**



1. In a process for producing an alkylate end product stream having a preselected vapor pressure comprising reacting an olefin stream and an isoparaffin stream to form a resultant alkylate product stream, separating said resultant alkylate product stream into an isoparaffin stream, an alkylate stream and a vapor stream comprising normal butane and isopentane, the improvement comprising separating said vapor stream comprising normal butane and isopentane into a normal butane stream and a resultant material stream comprising isopentane,

controllably adding said resultant material stream comprising isopentane to said alkylate stream so as to form an alkylate end product stream,

measuring the vapor pressure of said alkylate end product stream and generating a signal representative of this measurement, and

controlling the addition of said resultant material stream comprising isopentane to said alkylate stream in response to said signal to produce an alkylate end product stream having a constant and preselected vapor pressure.

4,174,358
TOUGH THERMOPLASTIC NYLON COMPOSITIONS

Bennett N. Epstein, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 580,513, May 23, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,201

Int. Cl.[2] C08L *77/00*

U.S. Cl. 525—183 **55 Claims**

1. A toughened multiphase thermoplastic composition consisting essentially of one phase containing 60 to 99 percent by weight of a polyamide matrix resin of number average molecular weight of at least 5,000, and 1 to 40 percent by weight of at least one other phase containing particles of at least one polymer taken from the class consisting of branched and straight chain polymers having a particle size in the range of 0.01 to 1.0 microns and having sites which adhere to the polyamide matrix resin, and said at least one polymer having a tensile modulus in the range of about 1.0 to 20,000 psi, the ratio of the tensile modulus of the polyamide matrix resin to tensile modulus of said at least one polymer being greater than 10 to 1 wherein said at least one polymer comprises at least 20 percent by weight of said at least one other phase and is represented by the formula:

$$A_{(a)}-B_{(b)}-C_{(c)}-D_{(d)}-E_{(e)}-F_{(f)}-G_{(g)}-H_{(h)}$$

derived in any order from monomers A to H wherein

A is ethylene;

B is CO;

C is an unsaturated monomer taken from the class consisting of α,β-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, and derivatives thereof taken from the class consisting of monoesters of alcohols of 1 to 29 carbon atoms and the dicarboxylic acids and anhydrides of the dicarboxylic acids and the metal salts of the monocarboxylic, dicarboxylic acids and the monoester of the dicarboxylic acid having from 0 to 100 percent of the carboxylic acid groups ionized by neutralization with metal ions and dicarboxylic acids and monoesters of the dicarboxylic acid neutralized by amine-ended caprolactam oligomers having a DP of 6 to 24;

D is an unsaturated epoxide of 4 to 11 carbon atoms;

E is the residue derived by the loss of nitrogen from an aromatic sulfonyl azide substituted by carboxylic acids taken from the class consisting of monocarboxylic and dicarboxylic acids having from 7 to 12 carbon atoms and derivatives thereof taken from the class consisting of monoesters of alcohols of 1 to 29 carbon atoms and the dicarboxylic acids and anhydrides of the dicarboxylic acids and the metal salts of the monocarboxylic, dicarboxylic acids and the monoester of the dicarboxylic acid having from 0 to 100 percent of the carboxylic acid groups ionized by neutralization with metal ions;

F is an unsaturated monomer taken from the class consisting of acrylate esters having from 4 to 22 carbon atoms, vinyl esters of acids having from 1 to 20 carbon atoms, vinyl ethers of 3 to 20 carbon atoms, vinyl and vinylidene halides, and nitriles having from 3 to 6 carbon atoms;

G is an unsaturated monomer having at least one substituent selected from the group consisting of pendant hydrocarbon chains of 1 to 12 carbon atoms and pendant aromatic

groups which may have 1 to 6 substituent groups having a total of 14 carbon atoms; and

H is an unsaturated monomer taken from the class consisting of branched, straight chain and cyclic compounds having from 4 to 14 carbon atoms and at least one additional unsaturated carbon-carbon bond capable of being grafted with a monomer having at least one reactive group of the type defined in C, D and E;

monomers A to H being present in the following mole fraction: (a) 0 to 0.95, (b) 0 to 0.30, (c) 0 to 0.5, (d) 0 to 0.5, (e) 0 to 0.5, (f) 0 to 0.99, (g) 0 to 0.99, and (h) 0 to 0.99; said at least one polymer having present at least one of monomers B, C, D and E with the proviso that when monomer A is present, in addition to at least one of monomers B, C, D and E, at least one of monomers F, G and H is also present, and further provided that when said at least one polymer is present as part of a mixture, that the components of the mixture co-exist in the same discrete particles in the polyamide matrix.

4,174,359

FLAME RETARDANT POLYCARBONATE POLYBLENDS

Parameswar Sivaramakrishnan, and Arthur L. Baron, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 830,518, Sep. 6, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 891,252

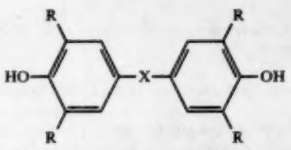
Int. Cl.[2] C08L *67/00*

U.S. Cl. 525/1 **31 Claims**

1. A halogen-containing aromatic copolycarbonate blend comprising

(a) an aromatic diphenol-aromatic thiodiphenol copolycarbonate comprising the reaction product of

(i) an aromatic diphenol having the structural formula

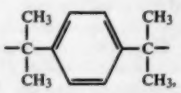


wherein

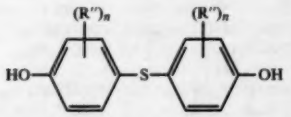
R is identical or different and denotes H or C_1–C_4-alkyl, and

wherein

X is a bond, C_1–C_8-alkylene, C_2–C_8-alkylidene, C_5–C_{15}-cycloalkylene, C_5–C_{15}-cycloalkylidene, $—SO_2—$, —SO—, —CO— or



(ii) an aromatic thiodiphenol having the structural formula



wherein

R″, which may be identical or different, is H or C_1–C_4-alkyl, and n is 0, 1 or 2, and

(iii) a member selected from the group consisting of carbonyl bromide, phosgene, bischloroformic esters of (i) and (ii) and diaryl carbonates

(b) intimately blended with an effective amount of a halogen-containing compound whereby the critical thickness and flammability properties of the halogen-containing, aromatic copolycarbonate blend is improved.

3. The halogen-containing, aromatic copolycarbonate blend of claim 1 wherein said halogen-containing compound is an aromatic diphenol-halogenated aromatic diphenol copolycarbonate comprising the reaction product of

(i) an aromatic diphenol,

(ii) a halogenated, aromatic diphenol, and

(iii) a member selected from the group consisting of carbonyl bromide, phosgene, bischloroformic esters of (i) or (ii) and diaryl carbonates.

4,174,360

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

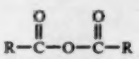
George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 821,256, Aug. 2, 1977, abandoned, which is a division of Ser. No. 678,096, Apr. 19, 1976, Pat. No. 4,049,753. This application May 19, 1978, Ser. No. 907,472

Int. Cl.[2] C08F *8/00, 8/02, 8/06, 8/10*

U.S. Cl. 260—880 **12 Claims**

1. A process for the production of a polymer comprising reacting an alkali metal-terminated polymer having the formula M-Z, wherein M represents an alkali metal and Z is a homopolymer or copolymer chain of one or more alkadienes of 4 to 12 carbon atoms per molecule or a copolymer chain of at least one alkadiene of 4 to 12 carbon atoms and at least one monovinylsubstituted arene radical of 8 to 18 carbon atoms per molecule, the vinyl radical being attached to a carbon atom of the arene ring with a coupling agent having the formula



wherein the radicals R, which can be the same or different, are hydrocarbyl radicals with 1 to 7 carbon atoms, and wherein the coupling agent is employed in such a quantity that about 0.1 to about 0.25 mole of coupling agent is present per gram atom of alkali metal M at the beginning of the coupling reaction mixture.

4,174,361

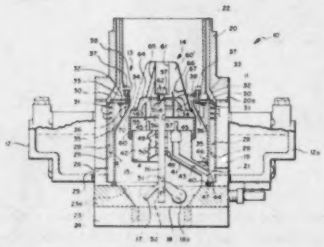
VARIABLE DOWNDRAFT CARBURETOR

Ralph T. Rollins, 1964 Longview Dr., Holladay, Utah 84117

Filed May 22, 1978, Ser. No. 907,986

Int. Cl.[2] F02M *9/14*

U.S. Cl. 261—41 B **7 Claims**



1. A variable Venturi, condition responsive carburetor comprising

a carburetor housing having a central passage extending downwardly therethrough;

a fixed Venturi member having a curved shoulder fixed in said central passage and extending into said central passage;

a movable Venturi member having a curved shoulder cooperating with the curved shoulder of the fixed Venturi member to form a Venturi throat;

passage means adapted to connect the Venturi throat with a source of fuel through the fixed Venturi member;

means connecting the movable Venturi member to an accelerator control mechanism for an engine;

means for mounting the carburetor to an intake manifold of the engine;

passage means through the movable Venturi member to the Venturi throat, when said movable Venturi member is in a lowered position; and

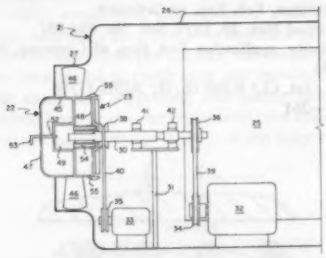
means connecting the passage means through the movable Venturi member to the source of fuel only when the movable Venturi member is in its lowered position.

4,174,362

HUMIDIFER

Michael Rahman, Winston-Salem, N.C., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 20, 1978, Ser. No. 898,242
Int. Cl.[2] F24F *3/14*
U.S. Cl. 261—90 **2 Claims**



1. An improved humidifying apparatus comprising:

a. a fan assembly inclusive of

i. a shaft,

ii. a hub member mounted to rotate on said shaft, said hub member having a chamber formed therein to serve as a water plenum; and

iii. fan blades mounted to extend from said hub member;

b. means to deliver water to said chamber;

c. a slinger assembly mounted to rotate coaxial with, independent of and adjacent to said hub member, said slinger assembly inclusive of

i. a first disc-shaped plate having, on its face nearest said hub member, three or more vanes mounted on said nearest face to extend radially inward from the periphery of said first plate to define channels between adjacent vanes; and

ii. a second disc-shaped plate mounted face to face with said first plate such that said vanes are between said faces and the channels formed by said vanes are enclosed, said second plate having a cylindrical passage formed in the center thereof;

d. three or more water-carrying conduits, said conduits extending from said chamber through the end of said hub member to protrude from said hub member and through said cylindrical passage of said second plate to adjacent said nearest face of said first plate such that said conduits extend within said slinger assembly, said conduits being equally spaced radially from said shaft to define a circle on which said conduits are evenly spaced so that said conduits evenly distribute water from said chamber onto said nearest face of said first plate such that water is impelled outwardly from said slinger assembly by centrifugal force; and

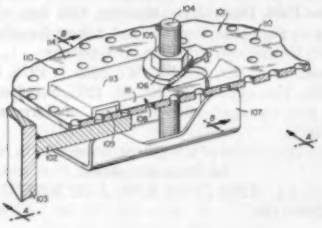
e. a tubular member coaxially mounted to said hub member to rotate therewith, said tubular member including a plurality of fins spaced circumferentially from one another to form a cylindrical array which extends outward from said hub member to circumscribe said slinger assembly.

4,174,363

VAPOR-LIQUID CONTACTING TRAY WITH VAPOR THRUST MEANS

Walter Bruckert, Antwerp, Belgium, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,296
Int. Cl.[2] B01D *3/22*
U.S. Cl. 261—114 TC **10 Claims**



1. In a vapor-liquid contacting column including a casing in which a plurality of generally horizontally aligned vapor-liquid contacting trays are disposed, vertically spaced apart from one another and mounted in said casing on substantially imperforate support rings such that the support rings underlie portions of said contacting trays for support thereof, with clamp means for rigidly securing said contacting trays to said support rings, said contacting trays each including a horizontally aligned deck having main flat top and bottom surfaces, with vapor flow perforation openings extending through said deck, and liquid transfer means associated with the tray for transferring liquid previously contacted on said tray deck to a next underlying tray in said contacting column, the improvement comprising: an enclosure member overlying and extending transversely across said deck main flat top surface from a portion thereof above said support ring to an adjacent perforated portion of said tray deck wherein the vapor flow perforation openings are unobstructed by said support ring such that said enclosure member forms an enclosed spatial volume with respect to and above the overlaid tray deck portion, with a vapor flow opening in said enclosure member located over the portion of said tray deck above said support ring, such that closed gas flow communication is provided from the vapor flow perforation openings in said adjacent perforated portion of said tray deck overlaid by said enclosure member to said vapor flow opening in said enclosure member, whereby vapor flowing through said perforation openings and entering said enclosed spatial volume of said enclosure member is directed through said vapor flow opening into the liquid on the tray deck main flat top surface portion overlying said support ring, to effect vapor-liquid contact and prevent liquid flow stagnation thereon.

4,174,364

PROCESS FOR MANUFACTURE OF POROUS METAL OBJECTS AND USE OF THE PROCESS FOR MANUFACTURE OF A POROUS MOLD

Claudio Balosetti, Via Varallo, 244, I-13011 Borgosesia, Vercelli, Italy

Filed Mar. 23, 1978, Ser. No. 889,530
Claims priority, application Switzerland, Feb. 10, 1978, 1507/78
Int. Cl.[2] B22F *3/16*
U.S. Cl. 264—111 4 Claims

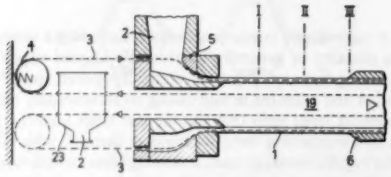
1. A process for the manufacture of porous metal objects comprising (1) mixing aluminum powder having a granulometric fineness of 600 to 25,000 mesh per cm^2 with at least 3% of a particulate mineral having a cellular structure and being selected from the group consisting of vegetable ash, animal ash and diatom fossil meal, (2) compacting the admixture to yield an object of sufficient green strength to be self-supporting, (3) heating the said object to a temperature from about 550° C. to about 600° C., and (4) hot pressing said object to yield a unitary porous metal object.

4,174,365

CONTINUOUS METHOD FOR MAKING HOSES WITH DESTRUCTION OF HORIZONTALLY DISPOSED MANDREL

Karl-Heinz Pahl, Düsseldorf-Lohausen, Fed. Rep. of Germany, assignor to Pahl'sche Gummi—und Asbest-Gesellschaft "PAGUAG", Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 684,347, May 7, 1976, Pat. No. 4,056,596. This application Jul. 25, 1977, Ser. No. 818,892
Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520853
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] B29D *23/04;* B29G *2/00;* B29H *7/14*
U.S. Cl. 264—146 22 Claims



1. An apparatus for the continuous production and vulcanization of a hose comprising means for continuously forming a hollow mandrel, means for continuously moving said mandrel axially and horizontally only, forming said hose about said mandrel, means for continuously vulcanizing said hose while on said mandrel, means for continuously reducing said mandrel into remnants after vulcanization of said hose, and means for removing the remnants of said mandrel from within said hose.

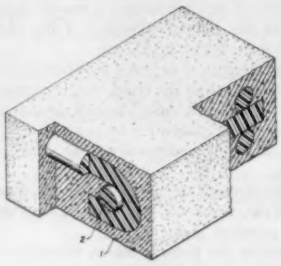
4,174,366

METHOD OF MAKING REINFORCED CONCRETE

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 781,591, Mar. 28, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,437
Int. Cl.[2] B28B *23/04;* B32B *13/02, 13/14*
U.S. Cl. 264—228 4 Claims

1. A method of pre-stressing a wet-laid concrete which comprises first soaking in water overnight then embedding at least one nontensioned polypyrrolidone reinforcing bar in wet-laid concrete, said embedding being effected by locating said nontensioned polypyrrolidone reinforcing bar within the concrete at least 0.75 times the width of the reinforcing bar from the surface of the wet-laid concrete said nontensioned polypyrrolidone reinforcing bar having a diameter of at least



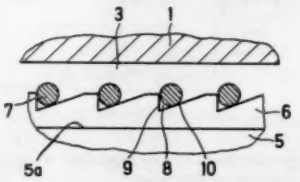
1/16-inch, and thereafter curing the so-treated wet-laid concrete.

4,174,367

FORM TOOL FOR PRODUCTION OF A REINFORCED HOSE PIECE

Rudolf Breher, Porta Westfalica, Fed. Rep. of Germany, assignor to Breco Kunststoffverarbeitungs-GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,352
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653741
Int. Cl.[2] B29F *00/00;* B23B *31/06*
U.S. Cl. 264—261 7 Claims



1. A form tool for the production of a hose shaped piece from an injectable material with a reinforcing pull-resistant wire means embedded therein and extending in the circumferential direction of the hose piece, the form tool comprising for production by injection moulding

an injection moulding device comprising,

a mould sleeve having a substantially cylindrical inner surface,

end plates mounted at both ends of said mould sleeve, at least one of said end plates being detachable from said mould sleeve,

a mould core having a substantially cylindrical outer surface being disposed inside of said mould sleeve and being withdrawable from said mould sleeve in an axial direction thereof, said mould core being mounted in said end plates and centered within said mould sleeve at both ends thereof by said end plates and defining with said mould sleeve an annular hollow mould space having a radial width greater than the diameter of the wire means, said mould core being sealingly closed at both ends thereof by said end plates, respectively,

an injection channel means disposed in one of said end plates, communicating with one end of said mould space, for injecting with injection pressure an injectable material into said mould space in an axial injection direction of the form tool,

said mould core being formed on said outer surface with a

plurality of longitudinal supporting ribs spaced apart in the circumferential direction of and extending in the axial direction of said mould core,

said supporting ribs constituting means for spacing said wire means at a predetermined radial distance from said outer surface of said mould core, while supporting and spacing said wire means simultaneously at a radial distance spaced from said inner surface of said mould sleeve,

said supporting ribs defining recesses adapted for receiving said wire means therein with the latter wound on said supporting ribs, said recesses being respectively arranged in said supporting ribs at predetermined distances in the longitudinal and circumferential directions of said supporting ribs in such a manner that said recesses form a predetermined helical line corresponding to a desired helical course for said wire means within the hose piece to be produced,

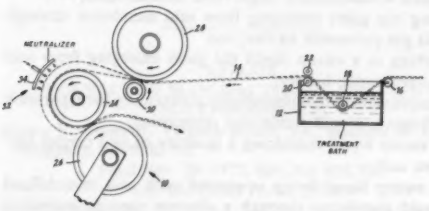
said recesses each having a sawtooth-like shape including a steep flank facing said injection channel means adapted to support said wire means in said injection direction and defining a depth of said recesses adapted for the injection moulding for preventing said wire means from rising over said steep flank out of said recesses under the force of the injection pressure during the injecting of the injectable material into said mould space,

said recesses also each including an inclined flank facing in a direction away from said injection channel means and flatly ascending in a removal direction counter to said injection direction, and adapted for enabling windings of said wire means to climb over said inclined flanks and to shift along said supporting ribs during axial stripping a finished hose piece over said mould core under a stripping pressure against the hose piece in the removal direction.

4,174,368
CURVED SAUSAGE CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,341
Int. Cl.[2] B29D *7/22*
U.S. Cl. 264—561 **9 Claims**

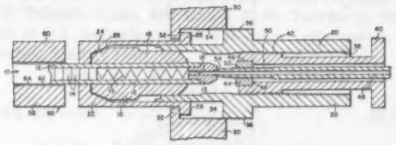


1. A method of producing curved regenerated cellulose casings which comprises the steps of (a) passing a regenerated cellulose tubular casing in contact with a cellulosic swelling solution for a time and at a concentration sufficient to plasticize said casing; (b) inflating the plasticized casing with an inert fluid; (c) passing said inflated plasticized casing around and in contact with a cylindrical surface to conform the shape of said plasticized casing to the shape of said cylindrical surface; (d) contacting said plasticized inflated casing with a neutralizing agent while said plasticized casing is disposed on said cylindrical surface, said neutralizing agent being employed in an amount and for a time sufficient to neutralize said cellulosic swelling solution impregnated in said casing; (e) removing said neutralized casing from said cylindrical surface and thereafter; (f) washing, plasticizing and drying said casing.

4,174,369
FLUID PRESSURE METHOD FOR RECOVERING FUEL PELLETS FROM NUCLEAR FUEL ELEMENTS

Clarence D. John, Jr., Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 749,869, Dec. 13, 1976. This application Nov. 1, 1977, Ser. No. 847,527
Int. Cl.[2] C22B *60/02*
U.S. Cl. 423—4 **5 Claims**



1. A method of removing fuel pellets from a metallic sheath of a fuel element comprising the steps of:

opening at least one end of said fuel element;

arranging a high pressure tube into contact with said opened end;

conducting water at a high pressure through said opened end and into said metallic sheath thereby internally pressuring said metallic sheath and expanding said metallic sheath away from said fuel pellets; and

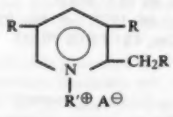
inclining said fuel element to the horizontal thereby allowing said fuel pellets to slide out of said metallic sheath.

4,174,370
SUBSTITUTED PYRIDINES

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 604,609, Aug. 14, 1975. This application Aug. 25, 1978, Ser. No. 937,040
Int. Cl.[2] C23F *9/00*
U.S. Cl. 422—12 **4 Claims**

1. A process of inhibiting the corrosion of metals which comprises treating a system, wherein metals are affected by corrosion, with a compound of the formula



where R is an alkyl, hydroxyalkyl, cycloalkyl or heterocyclic group and R′ is an alkyl, hydroxyalkyl, cycloalkyl, aryl or heterocyclic group, and $A\ominus$ is a carboxylate anion.

4,174,371
INTEGRATED SOLAR HEATED RESOURCE TRANSFORMATION SYSTEM

William M. Bell, 21 Imrie Rd., Allston, Mass. 02134, and David A. Del Porto, 88 Blueberry Hill La., Sudbury, Mass. 01776

Filed Nov. 29, 1977, Ser. No. 855,779
Int. Cl.[2] C05F *3/04, 3/06;* **F24J** *3/02*
U.S. Cl. 422—109 **23 Claims**

1. An organic waste treatment system for the production of humus or compost providing for the controlled aerobic composting of organic materials, comprising in combination:

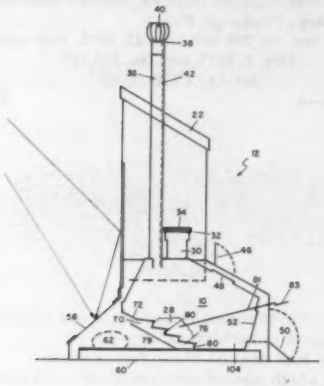
at least one composting chamber;

at least one thermal mass;

means for conveying air from the vicinity of at least one said thermal mass to at least one said composting chamber;

means for providing solar-derived heat to at least one said thermal mass;

at least one air intake port for providing air in the vicinity of at least one said thermal mass; and



ventilation means communicating with at least one said composting chamber.

4,174,372

PROCESS FOR TREATMENT OF ANTIMONY-CONTAINING MATERIALS

Felix A. Myzenkov, ulitsa Vavilova, 93, kv. 9; Dmitry N. Klushin, Bolshoi Matrossky pereulok, 1, kv. 64; Viktor A. Shupikov, ulitsa Nagornaya, 15, korpus 11a, kv. 118, all of Moscow; Alexandr A. Kaizer, ulitsa Klubnaya, 3, kv. 1; Anatoly M. Shuklin, ulitsa Klubnaya, 3, kv. 2, both of Kirgizskaya SSR, Oshskaya oblast, Frunzensky raion, poselok Frunze; Mikhail D. Deresh, ulitsa Junykh Lenintsev, 89, korpus 2, kv. 52, Moscow; Nikolai A. Kolbin, Tashavtomash, 31, kv. 47, Tashkent; Alla P. Tolmacheva, ulitsa Vavilova, 93, kv. 9; Galina V. Zyryanova, ulitsa Petrozavodskaya, 15, korpus 2, kv. 144, both of Moscow; Vitaly M. Uzlov, ulitsa Kirova, 10, kv. 5, Kirgizskaya SSR, Oshskaya oblast, Frunzensky raion, poselok Frunze, and Elka I. Shmuelzon, ulitsa Metrostroevskaya, 35, kv. 38, Moscow, all of U.S.S.R.

Filed Jul. 26, 1977, Ser. No. 819,001

Int. Cl.[2] C01B *29/00*

U.S. Cl. 423—88 **10 Claims**

1. A process for treatment in a fluidized bed of antimony-containing materials involving combustion of the materials in the fluidized bed formed by the material, a fuel gas and an oxygen-containing gas at a temperature within the range of from 800° to 1,100° C. obtained by combusting a mixture of said fuel gas and oxygen-containing gas,

supplying said fuel gas and said oxygen-containing gas through separated openings to the fluidized bed, and

forming said gas mixture directly in the fluidized bed after supplying thereinto said fuel gas and oxygen-containing gas as separate streams through said separate openings and uniformly distributed over the bottom of the fluidized bed so that the fuel gas stream is surrounded in the fluidized bed over its entire perimeter by the oxygen-containing gas streams.

4,174,373

PROCESS FOR REMOVING SULFUR OXIDES AND NITROGEN OXIDES FROM FLUE GASES

Kazuetsu Yoshida, Hachioji; Michiharu Seki, Fuchu; Keiichi Kanehori, Tokyo; Katsuhiro Kaneko, Sayama, and Yo Sakurai, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1975, Ser. No. 609,081

Claims priority, application Japan, Sep. 4, 1974, 49/100904

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 **26 Claims**

1. A process for removing at least one of nitrogen oxides and sulfur oxides contained in a flue gas, which comprises contacting a flue gas containing at least one of nitrogen oxides and sulfur oxides with a catalyst comprising a carbonaceous material impregnated with at least one of bromine, iodine, chlorine, ammonium bromide, ammonium iodide, ammonium chloride, hydrogen bromide, hydrogen iodide and hydrogen chloride, and at least one of metal elements of groups 1B, 3B, 4B, 5B, 6B, 2A, 3A and 8 of the periodic table as a promoter in the presence of ammonia.

4,174,374

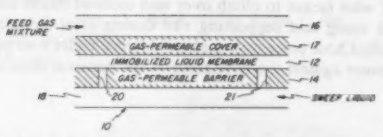
MAINTAINING THE SEPARATION EFFICIENCY OF IMMOBILIZED LIQUID MEMBRANES IN GAS SEPARATION METHODS AND APPARATUS

Stephen L. Matson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 809,116, Jun. 22, 1977, Pat. No. 4,114,408. This application Aug. 16, 1978, Ser. No. 934,013

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—232 **9 Claims**



1. In a method for removing a gaseous component from a gaseous mixture comprising:

contacting said mixture with an immobilized liquid membrane containing in the liquid thereof at least one carrier species which is reversibly chemically reactive with said component to effect facilitated transport of said component through said membrane to a gas-permeable barrier which is substantially impervious to said liquid;

passing the gases emerging from said membrane through said gas-permeable barrier; and

absorbing in a sweep liquid the gases emerging from said gas-permeable barrier;

the improvement for substantially maintaining the separation efficiency of said membrane; comprising:

said sweep liquid containing a quantity of said carrier species; and

said sweep liquid being contacted with said immobilized liquid membrane through a discrete passage extending transversely through said barrier, to effect diffusive transfer of at least a portion of said reactive species from said sweep liquid into the liquid immobilized in said membrane.

4,174,375

PROCESS FOR REMOVING FLUORINE COMPOUNDS AND SULFUR DIOXIDE FROM EXHAUST GASES

Stephen L. Holehouse, Frankfurt am Main, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,716

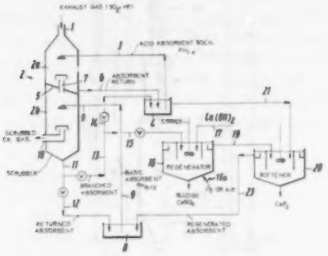
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735566

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 **8 Claims**

1. A process for removing hydrogen fluoride and sulfur dioxide from exhaust gas comprising the steps of:

(a) scrubbing the exhaust gas in a first scrubbing stage with acid absorbent solution containing ions of sodium, potassium or ammonium and having a pH-value of at most 5 to remove a major part of the fluorine compounds;
(b) recycling part of the absorbent solution used in step (a) to said first scrubbing stage;
(c) scrubbing the exhaust gas scrubbed in the first scrubbing stage in a second scrubbing stage with a basic absorbent solution containing ions of sodium, potassium or ammonium and having a pH-value of at least 8 to remove SO_2 and residual hydrogen fluoride and produce a highly water-soluble sulfite and/or sulfate;



(d) in a regeneration zone regenerating a first part of the absorbent solution used in the second scrubbing stage (c) by the addition of calcium hydroxide thereto, and withdrawing sludge from the regeneration zone;
(e) softening regenerated scrubbing solution from step (d) by mixing it in a softening zone with absorbent solution used in and withdrawn from step (a) which contains fluoride ions to precipitate calcium fluoride, and recovering the calcium fluoride precipitated;
(f) mixing softened absorbent solution which has been regenerated and softened in step (e) with a second part of the absorbent used in the second scrubbing stage (c) and feeding the resulting mixture as the basic absorbent solution to the second scrubbing stage; and
(g) withdrawing a third part of the absorbent solution used in the second scrubbing stage (c) and feeding this third part to the first scrubbing stage (a) as part of the solution to be used therein.

4,174,376

PROCESS FOR MANUFACTURING POTASSIUM POLYPHOSPHATE

James E. Seymour, Virginia Beach, Va., assignor to Royster Company, Norfolk, Va.

Filed Nov. 29, 1977, Ser. No. 855,780
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—315 **2 Claims**

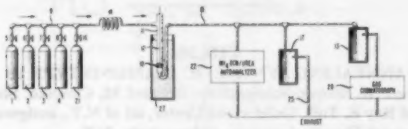
1. A process for making potassium polyphosphate, comprising the steps of:
(a) combining ammonium bisulfate, sulfuric acid, phosphate rock and water to form decomposed phosphate rock,
(b) filtering the decomposed phosphate rock,
(c) adding to the decomposed phosphate rock filtrate a material selected from the group consisting of potassium chloride, potassium sulfate and potassium chloride and potassium sulfate to yield combination;
(d) filtering said first combination to remove potassium fluosilicate,
(e) adding additional potassium chloride to the filtrate to yield a second combination, said additional potassium chloride being added in an amount sufficient to permit polymerization under heat of said second combination,
(f) heating said second combination to at least the polymerization point,
(g) separating solid potassium polyphosphate from the vapor phase of the second combination,
(h) processing said second combination following said removal of potassium polyphosphate to yield bisulfate and sulfuric acid, and
(i) recycling the ammonium bisulfate and sulfuric acid to the process input.

4,174,377

FORMATION OF CYANATE COMPOUNDS

Lee E. Trimble, Clark, and Rudolf J. H. Voorhoeve, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 25, 1978, Ser. No. 909,381
Int. Cl.[2] C01C *3/00, 3/14*
U.S. Cl. 423—365 **14 Claims**



1. A process for producing isocyanic acid comprising the steps of (1) contacting a hydrogenation catalyst with a reaction mixture comprising a nitrogen oxide, CO, and a source of hydrogen under reaction conditions which avoid the substantial formation of collectible ammonia from said reaction mixture and (2) removing said isocyanic acid from the reactant flow.

9. A process for producing ammonium cyanate comprising the steps of (1) contacting a hydrogenation catalyst with a reaction mixture comprising a nitrogen oxide, CO, a source of hydrogen, and ammonia under reaction conditions which avoid the substantial in situ formation of ammonia entities from said reaction mixture and (2) removing said ammonium cyanate from the reactant flow.

4,174,378

IRIDIUM COMPOUND AND PREPARATION THEREOF

Anthony J. Scarpellino, Jr., Tuxedo, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,618
Int. Cl.[2] C01B *21/00;* **C01G** *55/00*
U.S. Cl. 423—386 **10 Claims**

1. A method of preparing an iridium compound comprising refluxing a diammonium hexahalo salt of iridium, said salt being a member of the group consisting of $(NH_4)_2IrCl_6$ and $(NH_4)_2IrBr_6$, and sulfamic acid in an aqueous medium for a period of time greater than about 30 hours, to permit the formation of a precipitate, said precipitate forming after distillation and cooling of the resultant refluxing product.

4,174,379

MANUFACTURE OF AMMONIUM NITRATE

Robert E. Froehlich, New Providence, and Reginald A. Baldini, South Orange, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 13, 1978, Ser. No. 895,884
Int. Cl.[2] C01B *1/18*
U.S. Cl. 423—396 **19 Claims**

1. A process for the manufacture of ammonium nitrate using urea process tail gas, said tail gas including ammonia, carbon dioxide and water vapor, said process including the steps of:
(a) reacting water with nitrogen dioxide in an absorption tower to form nitric acid;
(b) reacting said urea process tail gas with said nitric acid to yield an aqueous solution including ammonium nitrate and water, and a tail gas including carbon dioxide, ammonia and water vapor;

(c) adding a carrier gas to said ammonium nitrate process tail gas to yield a resultant gaseous stream;

(d) cooling said resultant gaseous stream to approximately 60 degrees C., a portion of said water vapor included in said resultant stream being condensed to water, a portion of said ammonia reacting with a portion of said carbon dioxide to form ammonium carbonate and/or ammonium bicarbonate, said carrier gas acting to prevent condensation of some of said water vapor included in said resultant gaseous stream;

(e) separating said condensed water from said cooled resultant stream;

(f) passing said cooled resultant gaseous stream including a water vapor portion to the atmosphere, and

(g) passing said water to said absorption tower for use in said formation of nitric acid.

4,174,380

ANNEALING SYNTHETIC DIAMOND TYPE IB

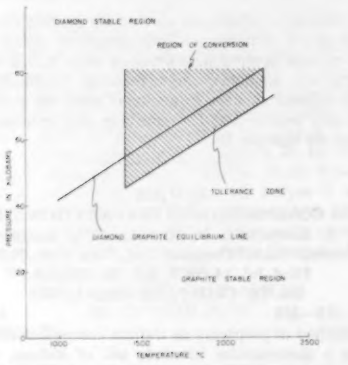
Herbert M. Strong, Schenectady; Richard M. Chrenko, Scotia, and Roy E. Tuft, Guilderland Center, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 707,298, Jul. 21, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,283

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[2] C01B *31/06*

U.S. Cl. 423—446 **12 Claims**



1. An annealing process for converting type Ib nitrogen in synthetic diamond crystal to type Ia nitrogen, said crystal having a minimum size of one micron as measured along the longest edge dimension of the crystal which consists essentially of subjecting said synthetic diamond crystal to an annealing temperature ranging from about 1500° C. to about 2200° C. under at least a pressure which prevents significant graphitization of said crystal at said annealing temperature for a period of time ranging from about one minute to about 50 hours and sufficient to convert at least about 20% of the total amount of type Ib nitrogen present in said crystal to type Ia nitrogen, the minimum pressure ranging from 48 kilobars at said annealing temperature of 1500° C. to a minimum pressure of 70 kilobars at said annealing temperature of 2200° C., and recovering the resulting annealed free synthetic diamond crystal wherein the dissolved nitrogen detectable by ultraviolet, visible and infrared absorption spectra and electron paramagnetic resonance consists of types Ib and Ia nitrogen, said type Ib nitrogen always being present in said annealed crystal in at least a detectable amount, said annealing process making no significant change in the morphology and physical dimensions of said synthetic diamond crystal.

4,174,381

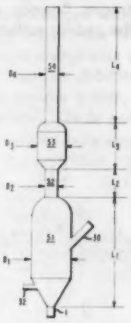
CHLORINE AND IRON OXIDE FROM FERRIC CHLORIDE—PROCESS AND APPARATUS

James W. Reeves; Robert W. Sylvester, both of Wilmington, Del., and David F. Wells, Avondale, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 24, 1978, Ser. No. 899,696

Int. Cl.[2] C01B *7/03*

U.S. Cl. 423—502 **4 Claims**



1. In a process for producing chlorine and iron oxide in a multistage recirculating-fluidized-bed reactor, wherein ferric chloride is treated in the vapor phase with an excess of oxygen at superatmospheric pressure and at a temperature from 550° to 800° C. in the presence of a catalyst made from sodium chloride and iron oxide, a carbonaceous fuel is fed to the reactor to supply supplemental heat, particles of bed material are recirculated to the reactor, and gaseous and solid effluents are separated and recovered downstream of the reactor,

the improvement comprising carrying out the process in reaction zones comprising

(1) an initial dense zone having a length-to-diameter ratio, $(L/D)_1$, from 2:1 to 4:1, wherein a solids volume fraction, S_1, from 0.3 to 0.6 and a superficial gas velocity, V_1, in the range of 0.15 to 0.6 meters/second are maintained and wherein the fuel is burned, the recirculated-bed material and reactants are heated, the ferric chloride is vaporized and oxidation of the ferric chloride is initiated, and

(2) a downstream dilute zone having a length-to-diameter ratio, $(L/D)_4$, of at least 10:1 wherein a solids volume fraction, S_4, from 0.005 to 0.05 and a superficial gas velocity, V_4, from 1.5 to 6 meters/second are maintained, which velocity is from 4 to 25 times the superficial gas velocity in the dense zone.

4,174,382

PROCESS FOR THE PRODUCTION OF COARSE K_2SO_4 IN CRYSTALLIZERS AND CLASSIFIERS

Eckhard Menche, Heringen, Fed. Rep. of Germany, assignor to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,727

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627871

Int. Cl.[2] C01D *5/00, 15/06, 17/00*

U.S. Cl. 423—552 **8 Claims**

1. A continuous process for producing K_2SO_4 which comprises:

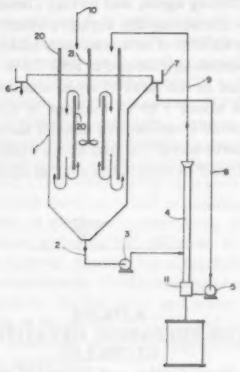
(a) introducing K_2SO_4 or K_2SO_4 precursor and a solvent therefor into a crystallizer having a slurry outlet means at the bottom portion thereof, an overflow means for supernatant liquid at the top portion thereof and circulating means therein;

(b) supersaturating the resultant solution of K_2SO_4 in said crystallizer, and crystallizing K_2SO_4 out of the resultant supersaturated solution of K_2SO_4 to form a slurry com-

prising coarse and fine crystalline K_2SO_4 and supernatant, said slurry having a slurry density of over 40% and up to about 80% by weight;

(c) withdrawing slurry from the bottom portion of said crystallizer and introducing said slurry into a separate elutriation classifier comprising an elongated tubular vessel;

(d) withdrawing supernatant collecting at the overflow means of the crystallizer and introducing supernatant into the lower portion of said elongated tubular vessel;



(e) maintaining a slurry density of from about 15% to about 25% by weight, and a flow rate sufficient to effect elutriative separation of particles of a size below 0.16 mm from coarser particles, within said elongated tubular vessel;

(f) withdrawing the supernatant and fine crystalline K_2SO_4 passing upwardly in the elongated tubular vessel, as overhead from the elongated tubular vessel and recycling same to the crystallizer; and,

(g) withdrawing coarse crystalline K_2SO_4 of a particle size above 0.16 mm at the lower portion of said elongated tubular vessel.

4,174,383

PROCESS FOR PURIFYING A SULFUR DIOXIDE CONTAINING GAS WITH PRODUCTION OF ELEMENTAL SULFUR

Andre Deschamps, Chatou; Claude Dezael, Maisons Laffitte; Henri Gruhier, Chatillon sous Bagneux, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 532,606, Dec. 13, 1974, abandoned. This application Aug. 26, 1976, Ser. No. 717,943

Claims priority, application France, Dec. 17, 1973, 73 45151

Int. Cl.[2] **C01B** *17/00, 7/02*

U.S. Cl. 423—573 R **12 Claims**

1. A process for purifying a sulfur dioxide-containing gas, comprising the steps of:

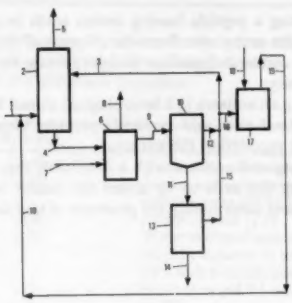
(a) contacting the impure gas with an aqueous solution containing at least ammonium sulfite, ammonium thiosulfate, and ammonium sulfate and to form a solution having at the end of said contact step a pH from 3.5 to 5, in order to absorb sulfur dioxide, then separating the gas from the solution,

(b) reacting resultant SO_2-containing aqueous solution from step (a) whose pH is from 3.5 to 5 with a hydrogen sulfide containing gas at 20°–90° C., to produce an aqueous phase containing dispersed solid sulfur and dissolved ammonium sulfate and ammonium thiosulfate,

(c) separating resultant aqueous phase containing sulfur into (1) a concentrated dispersion of said sulfur in a fraction of said aqueous phase and (2) a substantially sulfur-free fraction of said aqueous phase,

(d) heating the concentrated dispersion of step (c) to melt sulfur contained therein and separating said molten sulfur therefrom to form a substantially sulfur-free aqueous phase,

(e) recycling to step (a) a portion of said substantially sulfur-free aqueous phases obtained in steps (c) and (d), the total amount of dissolved ammonium sulfate and the total amount of dissolved ammonium thiosulfate in said aqueous phases emanating from steps (c) and (d) being greater with respect to the amounts of ammonium sulfate and ammonium thiosulfate, respectively, in the aqueous absorbing solution of step (a),



(f) introducing residual portion of said substantially sulfur-free aqueous phases into a molten salt formed of ammonium sulfate and/or bisulfate at 250°–400° C. and decomposing ammonium sulfate and ammonium thiosulfate in said residual portion in order to produce a decomposition gas containing sulfur dioxide, ammonia and steam so as to retard a buildup with respect to time of ammonium sulfate and ammonium thiosulfate in the process, and

(g) recycling said decomposition gas to step (a).

4,174,384

FLUORESCENCE QUENCHING WITH IMMUNOLOGICAL PAIRS IN IMMUNOASSAYS

Edwin F. Ullman, Atherton, and Moshe Schwarzberg, Palo Alto, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation of Ser. No. 591,386, Jun. 30, 1975, Pat. No. 3,996,345, which is a continuation-in-part of Ser. No. 497,167, Aug. 12, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,255

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.[2] **G01N** *21/38, 31/00, 33/16;* **C07G** *7/00*

U.S. Cl. 424—8 **4 Claims**

1. A composition for determining the presence or amount of a ligand comprising two chromophores, which are a fluorescer-quencher pair, the amount of fluorescer within quenching distance of said quencher being affected by the presence or amount of ligand, wherein each chromophore is covalently bonded to an anti-ligand capable of specific non-covalent binding to said ligand.

4,174,385

METHOD OF IDENTIFICATION OF SURFACE PROTEINS OF CANCER CELLS, CLINICAL TEST AND METHOD OF IMMUNIZATION

Robert H. Reid, 910 Rivenoak, Birmingham, Mich. 48008, assignor to Robert Reid; Robert Alpern; Allan B. Schmier; Sheldon A. Fealk and Jerry Michael Ellis, all of Southfield, Mich., a part interest to each

Filed Oct. 8, 1976, Ser. No. 730,764
Int. Cl.[2] A61K *43/00*; G01N *33/16*
U.S. Cl. 424—1 7 Claims

1. A method of identification of a specific cancer in a subject, comprising:

(a) synthesizing a peptide having amino acids in sequence including the active site from the n-terminal tridecapeptide of the cancer cell surface antigen protein for specific cell immunity;

(b) developing an antisera in a heterologous animal by injecting the animal with said synthetic peptide, bleeding the animal and recovering the antisera;

(c) conjugating said antisera with a detectable tag; and

(d) contacting the cells to be tested for cancer with said conjugate and determining the presence of said detectable tag.

4,174,386

AEROSOL ANTIPERSPIRANT COMPOSITIONS WITH GOOD ADHERENCE TO THE SKIN

Joseph G. Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10011; Marvin Small, 1100 Park Ave., New York, N.Y. 10028, and Dorothea C. Marra, 107 Fernwood Rd., Summitt, N.J. 07901

Continuation-in-part of Ser. No. 724,425, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 706,857, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,388, Mar. 3, 1975, Pat. No. 3,970,219, Ser. No. 670,913, Mar. 26, 1976, Pat. No. 4,019,657, Ser. No. 566,562, Apr. 9, 1975, abandoned, Ser. No. 620,448, Oct. 7, 1975, abandoned, and Ser. No. 628,283, Nov. 3, 1975, abandoned. This application Dec. 18, 1978, Ser. No. 970,013
Int. Cl.[2] A61K *7/32, 7/34, 7/38*
U.S. Cl. 424—47 30 Claims

1. An aerosol antiperspirant composition that is highly concentrated with respect to the active antiperspirant, and capable of being dispensed from aerosol containers of the foam type at a low delivery rate in a propellant gas:liquid ratio within the range from about 10:1 to about 40:1 comprising, in combination, a liquid phase comprising a nonvolatile miscible organic liquid in an amount within the range from about 0.1 to about 30% by weight of the composition; an antiperspirant salt in an amount within the range from about 8 to about 30% by weight of the composition; a bulking agent in an amount within the range from about 0.1 to about 5% by weight of the composition; a liquefied propellant having a vapor pressure of at least 2.4 atmospheres absolute at 21° C., in an amount of at least 0.15 mole per atmosphere absolute pressure at 21° C. per 100 g of composition to generate an expelled gas:liquid ratio within the range from about 10:1 to about 40:1 and a solid saturated aliphatic carboxylic acid having from about fourteen to about twenty-two carbon atoms in a straight chain and in an amount within the range from about 0.1 to about 5% by weight of the composition to improve adherence of the antiperspirant salt to the skin.

4,174,387

REDUCTION OF ABRASIVENESS IN DENTIFRICES

Martin Cordon, Highland Park, and Robert E. Dickson, Belle Mead, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 544,618, Jan. 28, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,131
Int. Cl.[2] A61K *7/18*
U.S. Cl. 424—52 6 Claims

1. A dentifrice having a pH above about 7 obtained by incorporation therein of not more than an effective amount of an alkaline buffering agent, and having cleaning and polishing characteristics containing the abrasive system consisting of at least 10 and up to 70% of an amorphous alkali metal or alkaline earth metal alumino-silicate and at least 7.5% and up to 20% of calcined alumina in the form of alpha-alumina flakes having a particle size of about 1 to 15 microns in diameter and in an amount to provide a radioactive enamel abrasion value to the dentifrice of above about 450, and about 0.005–1.0% of a water soluble fluoride salt to reduce the enamel abrasion of the dentifrice.

4,174,388

METHOD FOR PREPARING HEPATITIS B IMMUNE GLOBULIN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 830,291, Sep. 2, 1977, Pat. No. 4,118,477, which is a continuation-in-part of Ser. No. 768,236, Feb. 14, 1977, abandoned, which is a division of Ser. No. 587,707, Jun. 16, 1975, Pat. No. 4,024,243. This application Jul. 19, 1978, Ser. No. 925,736
Int. Cl.[2] A61K *39/42*
U.S. Cl. 424—86 1 Claim

1. A method of preparing hepatitis B immune globulin which comprises

selecting a plurality of individuals positive for hepatitis B surface antibody,

administering to the individuals hepatitis B surface antigen in an amount effective to stimulate antibody formation,

monitoring the antibody level of the individuals following administration of the hepatitis B surface antigen,

obtaining plasma from those individuals exhibiting an increase of hepatitis B surface antibody of at least 2,000 PHA units/ml,

and preparing hepatitis B immune globulin from the plasma.

4,174,389

OPHTHALMIC USE OF COLLAGENASE

Louise A. Cope, 3803 University Blvd., Houston, Tex. 77005

Filed May 13, 1977, Ser. No. 796,807
Int. Cl.[2] A61K *37/48*
U.S. Cl. 424—94 6 Claims

1. A method for the selective lysis of collagen fibrils located in the vitreous of the ocular region of a mammal comprising:

injecting intravitreally a small but effective amount of a pharmacologically suitable solution comprising a concentrated amount of collagenase;

contacting said fibrils with said solution;

flushing the intravitreal region by injecting an effective amount of an inactivator of collagenase solution; and

removing said collagenase solution from said intravitreal region before said solution damages other ocular structures not intended to be affected thereby.

4,174,390

ANTIBIOTIC A-7413 AND PROCESS FOR PREPARATION THEREOF

Robert L. Hamill, Greenwood, and W. Max Stark, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 766,306, Feb. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 737,456, Nov. 1, 1976, abandoned, which is a division of Ser. No. 655,670, Feb. 4, 1976, abandoned. This application Aug. 11, 1978, Ser. No. 932,833

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 9 Claims

1. A method of increasing feed-utilization efficiency in ruminant animals which comprises orally administering to said animals an effective propionate-increasing amount of a member selected from a group consisting of (1) A-7413 complex produced by cultivating Actinoplanes sp. NRRL 8122 in a culture medium containing assimilable sources of carbohydrate, nitrogen and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced; (2) A-7413 factor A which is a white to light-yellow crystalline material when crystallized from ethanol; which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; which melts with decomposition at about 205°–212° C. and which has:

(A) an apparent molecular weight of approximately 1308, as determined by titration;

(B) an approximate elemental composition of 51.92 percent carbon, 5.25 percent hydrogen, 9.85 percent nitrogen, 22.63 percent oxygen, and 9.66 percent sulfur;

(C) a proposed approximate empirical formula of $C_{72}H_{87}N_{12}O_{23}S_5$;

(D) a specific rotation, $[\alpha]_D^{25}$, of +54.5° (c 2.0, $CHCl_3$);

(E) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 2.93 (shoulder), 2.98 (medium), 3.24 (weak), 3.38 (shoulder), 3.44 (medium), 3.53 (weak), 5.78 (weak), 6.03 (strong), 6.56 (strong), 6.79 (medium), 7.08 (medium), 7.27 (weak), 7.49 (weak), 7.65 (weak), 8.08 (medium), 8.41 (weak), 8.62 (weak), 8.81 (medium), 9.03 (weak), 9.35 (medium), 9.60 (medium), 9.92 (weak), 10.20 (weak), 12.05 (weak), 12.66 (weak), and 13.51 (weak) microns;

(F) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
215 nm ($E_{1cm}^{1\%}$=485);
260 nm (shoulder; $E_{1cm}^{1\%}$=240);
300 nm (shoulder; $E_{1cm}^{1\%}$=170);
358 nm (shoulder; $E_{1cm}^{1\%}$=112.5);

(b) in acidic ethanol:
217 nm ($E_{1cm}^{1\%}$=440);
265 nm ($E_{1cm}^{1\%}$=227.5);
293 nm ($E_{1cm}^{1\%}$=210);
358 nm ($E_{1cm}^{1\%}$=95);

(c) in basic methanol:
278 nm (shoulder; $E_{1cm}^{1\%}$=255);
408 nm ($E_{1cm}^{1\%}$=80);

(G) a titratable group with a pK_a value of 7.9 in 80% aqueous dimethylformamide;

(H) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and an as-yet-unidentified amino acid;

(I) a characteristic X-ray powder diffraction pattern (Cu^{++} radiation, 1.54505 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.44	100
10.77	70
7.96	100
5.71	50
5.09	80
4.53	100
4.25	80
3.88	80
3.61	10
3.44	10
3.03	5

(J) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.57	Butanol sat. with water
0.49	Methyl isobutyl ketone: butanol:water (25:21:4)
0.62	Metanol:water (1:1)
0.30	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.71	Methanol:0.1 N HCl (3:1)

(K) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_f Value	Solvent System
0.26	Chloroform:methanol (9:1)
0.23	Acetonitrile: water (9:1)

(L) an acid function capable of forming salts and ester derivatives;

(M) at least one hydroxy group capable of esterification; and

(N) the ability to form derivatives with thiol carboxylic acids;

(3) A-7413 factor B which is a white to light-yellow amorphous material which melts above 300° C. and which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; and which has:

(A) an approximate elemental composition of 66.34 percent carbon, 8.73 percent hydrogen, 2.98 percent nitrogen, 19.39 percent oxygen, and 2.83 percent sulfur;

(B) a specific rotation, $[\alpha]_D^{RT}$, of −26.2° (c 7.5, DMSO);

(C) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 2.97 (strong), 3.38 (strong), 3.42 (strong), 3.50 (strong), 5.78 (shoulder), 5.99 (medium), 6.50 (medium), 6.80 (medium), 6.90 (shoulder), 7.00 (shoulder), 7.22 (medium), 7.27 (shoulder), 7.42 (weak), 7.58 (weak), 7.78 (shoulder), 7.97 (medium), 8.33 (shoulder), 8.53 (medium), 9.00 (shoulder), 9.26 (strong), 9.71 (strong), 11.11 (weak), 11.79 (weak), 12.35 (weak) and 13.25 (weak) microns;

(D) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
268 nm ($E_{1cm}^{1\%}$=104.3);
357 nm (shoulder; $E_{1cm}^{1\%}$=30);

(b) in acidic ethanol:
268 nm ($E_{1cm}^{1\%}$=108.5);
357 nm (shoulder; $E_{1cm}^{1\%}$=35);

(c) in basic ethanol:

268 nm (shoulder; $E_{1cm}^{1\%} = 178.6$);

(E) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and an as-yet-unidentified amino acid;

(F) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_f Value	Solvent System
0.46	Butanol sat. with water
0.33	Methyl isobutyl ketone: butanol:water (25:21:4)
0.58	Methanol:water (1:1)
0.26	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.71	Methanol:0.1 N HCl (3:1)

(G) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_S Value	Solvent System
0.09	Chloroform: methanol (9:1)
0.03	Acetonitrile:water (9:1)

(H) an acid function capable of forming salts and ester derivatives;

(I) at least one hydroxyl group capable of esterification; and

(J) the ability to form derivatives with thiol carboxylic acids;

(4) A-7413 factor C which is a white to light-yellow amorphous material which melts above 250° C. and which is soluble in methanol, chloroform, dimethylformamide, dichloroethane and dimethyl sulfoxide; is slightly soluble in ethanol and aqueous ethanol; but is insoluble in acetone, benzene, carbon tetrachloride, dichloromethane, methyl isobutyl ketone, ethyl acetate, diethyl ether and water; and which has:

(A) an approximate elemental composition of 69.38 percent carbon, 9.92 percent hydrogen, 2.34 percent nitrogen, 16.58 percent oxygen, and 1.73 percent sulfur;

(B) an infrared absorption spectrum in KBr disc with the following observable absorption maxima: 3.00 (medium), 3.38 (shoulder), 3.42 (strong), 3.51 (strong), 5.73 (medium), 6.02 (medium), 6.14 (shoulder), 6.52 (weak), 6.56 (weak), 6.77 (medium), 6.80 (shoulder), 6.97 (weak), 7.20 (weak), 8.25 (weak), 8.33 (weak), 8.40 (weak), 8.86 (weak), 9.39 (weak), 10.05 (weak), 10.53 (weak), 10.70 (weak), 11.77 (weak) and 13.66 (weak) microns;

(C) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral, 95% aqueous ethanol:
205 nm ($E_{1cm}^{1\%} = 356$);
235 nm (shoulder; $E_{1cm}^{1\%} = 180$);
260 nm (shoulder; $E_{1cm}^{1\%} = 127$);
290 nm (shoulder; $E_{1cm}^{1\%} = 104$);

(b) in acidic ethanol:
205 nm ($E_{1cm}^{1\%} = 356$);
235 nm (shoulder; $E_{1cm}^{1\%} = 180$);
260 nm (shoulder; $E_{1cm}^{1\%} = 127$);
290 nm (shoulder; $E_{1cm}^{1\%} = 103$);
355 nm (shoulder; $E_{1cm}^{1\%} = 40$);

(c) in basic ethanol:
260 nm (shoulder; $E_{1cm}^{1\%} = 268$);
325 nm (shoulder; $E_{1cm}^{1\%} = 189$);

(D) an amino-acid analysis, after acidic hydrolysis, which indicates the presence of ammonia, glycine, threonine, aspartic acid, and phenylalanine;

(E) the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as a detection organism:

R_S Value	Solvent System
0.82	Butanol sat. with water
0.90	Methyl isobutyl ketone: butanol:water (25:21:4)
0.31	Methanol:water (1:1)
0.06	Water:methanol:acetone (12:3:1); adjusted to pH 10.5 with NH_3OH and then lowered to pH 7.5 with H_3PO_4
0.42	Methanol:0.1 N HCl (3:1)

(F) the following R_f values in the silica-gel thin-layer-chromatographic systems indicated below, using *Bacillus subtilis* as a detection organism:

R_f Value	Solvent System
0.46	Chloroform:methanol (9:1)
0.42	Acetonitrile:water (9:1)

(G) an acid function capable of forming salts and ester derivatives;

(H) at least one hydroxyl group capable of esterification; and

(I) the ability to form derivatives with thiol carboxylic acids;

(5) the methyl ester derivative of A-7413 factor A, which is soluble in the same solvents as is A-7413 factor A, which has an approximate empirical formula of $C_{73}H_{89}N_{12}O_{23}S_5$, an ultraviolet absorption spectrum and an amino-acid content as given for A-7413 factor A, and which has an infrared absorption spectrum as shown in FIG. 4 of the drawings; (6) the acetyl and triacetyl ester derivatives of A-7413 factor A, each of which is soluble in the same solvents as is A-7413 factor A, each of which has an ultraviolet absorption spectrum, an amino-acid content, and an electrometric titration as given for A-7413 factor A, the acetyl-ester derivative having an approximate empirical formula of $C_{74}H_{89}N_{12}O_{24}S_5$ and an infrared absorption spectrum as shown in FIG. 5 of the drawings and the triacetyl-ester derivative having an approximate empirical formula of $C_{78}H_{93}N_{12}O_{26}S_5$ and an infrared absorption spectrum as shown in FIG. 6 of the drawings; and (7) the physiologically acceptable salts of A-7413 factors A, B, and C; or (8) the physiologically acceptable salts of the acetyl and triacetyl ester derivatives of A-7413 factor A.

4,174,391

SPIRAMYCIN ESTERS

Robert F. Chapman, Benfleet; David D. Jackson, Wickford, and Glyn E. Lee, Thorpe Bay, all of England, assignors to May & Baker Limited, Essex, England

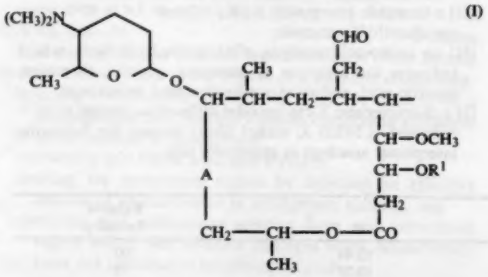
Filed Dec. 6, 1977, Ser. No. 857,999

Claims priority, application United Kingdom, Dec. 8, 1976, 51257/76

Int. Cl.[2] **A61K** *31/70*; **C07G** *11/00*

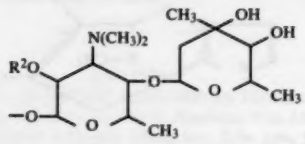
U.S. Cl. 424—180 **29 Claims**

1. A spiramycin derivative of the formula:



(I)

-continued



wherein R^1 represents acetyl, propionyl or hydrogen, A represents butenylene or butadienylene (wherein any double bonds present in A are trans), and R^2 represents a group of the formula:

(II)

wherein Z represents bivalent saturated or unsaturated alkylene of 1 to 6 carbon atoms, Y represents sulphur or oxygen, and R^3 represents alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, phenyl or phenylalkyl in which the alkylene moiety is of 1 to 6 carbon atoms.

27. A pharmaceutical antibiotic composition which comprises a therapeutically effective amount of spiramycin derivative as claimed in claim **1** or a non-toxic pharmaceutically acceptable acid addition salt thereof together with a compatible pharmaceutically acceptable carrier.

4,174,392

COMBATING ARTHROPODS WITH SUBSTITUTED TRIAZINE-2,4-DIONES

Edgar Möhring, and Peter Roessler, both of Berg. Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

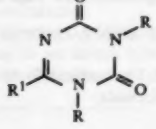
Filed May 9, 1978, Ser. No. 904,347

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723248

Int. Cl.[2] **A01N** *9/00, 9/22*

U.S. Cl. 424—249 **9 Claims**

1. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a substituted triazine-2,3-dione of the formula



in which

R is phenyl, naphthyl, or phenyl or naphthyl substituted by halogen, nitro or alkyl with 1–4 carbon atoms, and

R^1 is phenyl, naphthyl, or phenyl or naphthyl substituted by halogen, C_1–C_4 alkyl, nitro, C_1–C_4 halogenalkyl, C_1–C_4 alkoxy C_1–C_4 alkylmercapto, C_1–C_4 halogenoalkoxy or C_1–C_4 halogenoalkylmercapto.

4,174,393

1,3,4-SUBSTITUTED PYRAZOLINE DERIVATIVES

Jan J. Van Daalen, Weesp, and Rudolf Mulder, Lunteren, both of Netherlands, assignors to Duphar International Research B.V., Netherlands

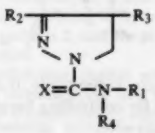
Continuation-in-part of Ser. No. 594,205, Jul. 9, 1975, Pat. No. 4,070,365. This application Jan. 5, 1977, Ser. No. 756,857

Claims priority, application Netherlands, Jan. 9, 1976, 7600178

Int. Cl.[2] **C07D** *231/06;* **A01N** *4/12, 9/22;* **C07D** *401/06*

U.S. Cl. 424—250 **18 Claims**

1. A compound of the formula:



wherein R_1 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring halogenated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring nitrated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, ring alkylated phenylalkyl wherein the alkyl moiety is of 1–4 carbon atoms, phenyl, phenyl substituted in the 2, 3 or 4 positions with up to two substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, halogenated alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, dialkylamino wherein each alkyl moiety is of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, acyl of an aliphatic saturated monocarboxylic acid, acylamino wherein the acyl moiety is of an aliphatic saturated monocarboxylic acid, nitro, phenyl, halogenated phenyl and cyano, R_2 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenyl substituted with 1 to 2 substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, monoalkylamino of 1 to 4 carbon atoms, dialkylamino wherein each alkyl is of 1 to 4 carbon atoms, nitro, phenyl, halophenyl and cyano, pyridyl, thienyl, halothienyl, nitrothienyl and alkyl substituted thienyl wherein the alkyl is of 1 to 4 carbon atoms, R_3 is a member selected from the group consisting of alkyl of 5 to 10 carbon atoms, alkyl of 1 to 6 carbon atoms substituted with a moiety selected from the group consisting of cycloalkyl of 3 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, nitro, piperidino, N-methyl-piperazino, halo, cyano, alkoxycarbonyl of 1 to 4 carbon atoms, nitrophenyl, halophenyl, alkyl substituted phenyl wherein the alkyl is of 1 to 4 carbon atoms, phenoxy, phenylthio, phenylsulfenyl, phenylsulfonyl, alkylphenylamino wherein the alkyl is of 1 to 4 carbon atoms, diphenylamino, dialkylamino wherein each alkyl is of 1 to 4 carbon atoms, N,N-dialkylcarbamoyl wherein each alkyl is of 1 to 4 carbon atoms and N,N-dialkylsulfamoyl wherein each alkyl is of 1 to 4 carbon atoms, R_4 is a member selected from the group consisting of hydrogen, alkyl of 1 to 15 carbon atoms, phenylalkyl wherein the alkyl is of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms and halomethylthio and X is a member selected from the group consisting of oxygen and sulfur and with the proviso that when R_1 is phenyl substituted with a moiety selected from the group consisting of phenylthio, phenoxy and phenylalkyl and/or R_4 is a member selected from the group consisting of phenylalkyl, cycloalkyl and halomethylthio R_3 may in addition be a member selected from the group as R_2.

17. An insecticidal composition comprising a compound of claim **1** in an insecticidally effective amount and a finely divided carrier therefore.

4,174,394

((5-NITRO-2-THIAZOLYL)THIO) AND ((5-NITRO-2-THIAZOLYL)SULFINYL)PYRAZINES

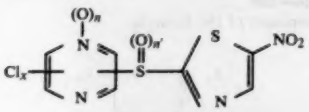
Craig E. Mixan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 24, 1978, Ser. No. 889,809

Int. Cl.[2] A61K *31/495;* **C07D** *241/18*

U.S. Cl. 424—250 **11 Claims**

1. A compound of the formula



wherein n, n' and x are, individually, 0 or 1.

11. A composition for controlling bacteria or fungi comprising an antimicrobially-effective amount of a compound of claim **1**.

4,174,395

4-[4-(2-METHYL-3-HYDROXY-4-HYDROXYMETHYL-5-PYRIDYL-METHYL)-1-PIPERAZINYL]-6-METHYL-PYRIMIDINES

Alain Beguin, Meudon, France, assignor to Societe Civile de Recherches et d'Applications Scientifiques, Paris, France

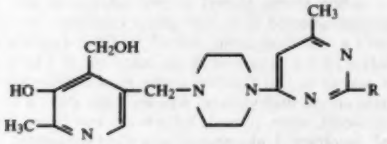
Filed Jul. 3, 1978, Ser. No. 921,335

Claims priority, application United Kingdom, Jul. 12, 1977, 29281/77

Int. Cl.[2] A61K *31/505;* **C07D** *401/14*

U.S. Cl. 424—251 **2 Claims**

1. New derivatives of pyrimidine of the general formula:



in which R represents a piperidino radical or a 4-(2-methyl-3-hydroxy-4-hydroxymethyl-5-pyridyl-methyl)-1-piperazinyl radical and therapeutically acceptable salts thereof.

2. A composition of matter for therapeutic use comprising as an active ingredient therein one of the compounds according to claim **1**, the active ingredient being present in sufficient amount to be effective as an anti-atheromal agent, and the active ingredient being incorporated in an appropriate carrier.

4,174,396

7,10-DIMETHYL-5,9-IMINO-4,5,8,9-TETRAHYDRO-CYCLOOCT[β]THIOPHENES AND A PROCESS FOR OBTAINING IT

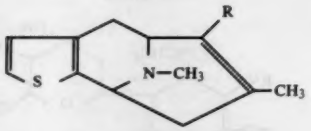
Ricardo Granados Jargue, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, Barcelona; Cirstobal Martinez Roldan, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratories Made, S.A., Madrid, Spain

Filed Apr. 3, 1978, Ser. No. 892,599

Int. Cl.[2] C07D *513/18;* **A61K** *31/44*

U.S. Cl. 424—256 **5 Claims**

4. A compound of the formula:



where R is H or lower alkyl or a pharmaceutically acceptable acid addition salt thereof.

4,174,397

THIAZOLIDINE DERIVATIVES

Bernd Knabe, Kelkheim; Hans-Jochen Lang, Hofheim am Taunas, and Ernold Granzer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany

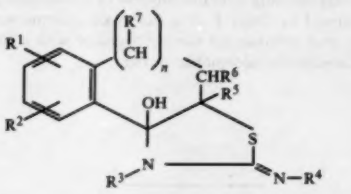
Filed Sep. 6, 1977, Ser. No. 830,774

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640358

Int. Cl.[2] C07D *277/60*

U.S. Cl. 424—270 **11 Claims**

1. Thiazolidine derivatives of the general formula I



I

in which R^1 denotes hydrogen, a methyl group, halogen, trifluoromethyl or an alkoxy group with 1–3 C atoms, R^2 denotes hydrogen, a methyl group, halogen or a nitro group, R^3 and R^4 are the same or different and denote alkyl or alkenyl with 1–4 C atoms, phenylalkyl with 1–2 C atoms in the alkyl part or cycloalkyl with 3–6 C atoms, R^5, R^6 and R^7 denote hydrogen or an alkyl radical with 1–3 C atoms and n is 0–2, or acid addition salts thereof with pharmaceutically acceptable acids.

9. A pharmaceutical preparation for the treatment of obesity or a lipid metabolism disorder of a compound as defined in claim **1** in an effective unit dosage.

4,174,398

COMBATING FUNGI WITH 1-ALKYL-1-(1,3,4-THIADIAZOL-2-YL)-3-PHENYL-UREAS

Erik Regel, Wuppertal; Paul-Ernst Frohberger, Leverkusen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

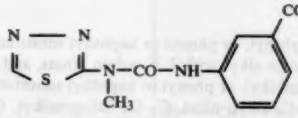
Filed Mar. 2, 1978, Ser. No. 882,833

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712630

Int. Cl.[2] A01N *9/12;* **C07D** *285/12*

U.S. Cl. 424—270 **3 Claims**

1. 1-Methyl-1-(1,3,4-thiadiazol-2-yl)-3-(3-butoxycarbonyl-phenyl)-urea of the formula



2. A fungicidal composition containing as active ingredient a

fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

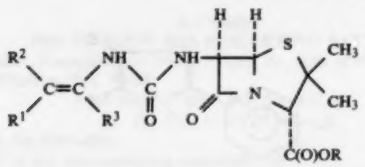
4,174,399

TREATMENT OF LACTIC ACIDOSIS IN RUMINANTS

Arthur F. Kluge, Los Altos, and Ian T. Harrison, Palo Alto, both of Calif., assignors to Syntex (USA) Inc., Palo Alto, Calif.

Filed Jul. 10, 1978, Ser. No. 923,276
Int. Cl.[2] A61K *31/43;* **C07D** *499/78*
U.S. Cl. 424—271 **21 Claims**

1. A compound selected from the group of the formula



(I)

herein R^1, R^2 and R^3 are individually hydrogen; C_1 to C_{12} linear or branched alkyl; C_6 to C_{12} carbocyclic aryl optionally substituted with halo, cyano, C_1 to C_6 linear or branched alkoxycarbonyl, C_1 to C_6 linear or branched alkyl, C_1 to C_6 linear or branched alkoxy; or C_4 to C_{11} heterocyclic aryl optionally substituted with C_1 to C_6 linear or branched alkyl or C_1 to C_6 linear or branched alkoxy, the heteroatom selected from the group nitrogen, oxygen and sulfur; and R is hydrogen or a protecting group selected from t-butyl, diphenylmethyl, benzyl, o-nitrobenzyl, p-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, p-methoxybenzyl, benzhydryl, pivaloxymethyl, phenacyl and C_2 to C_6 linear or branched haloalkyl; and pharmaceutically acceptable salts thereof with the proviso that at least one of R^1, R^2 and R^3 is other than hydrogen.

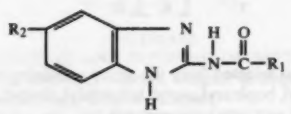
4,174,400

ANTHELMINTIC BENZIMIDAZOLES

Helmut Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 13, 1978, Ser. No. 941,997
Int. Cl.[2] A61K *31/415;* **C07D** *235/32*
U.S. Cl. 424—273 B **10 Claims**

1. A compound having the formula:



wherein R_1 is loweralkoxy; and

R_2 is halogenated loweralkenyl.

10. A method for the treatment of helmintic infections which comprises administering to an animal infected with parasites with an effective amount of a compound of claim 1.

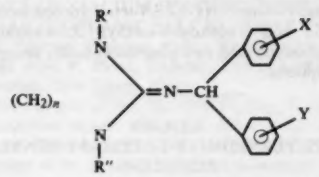
4,174,401

2-BENZHYDRYLIMINO-IMIDAZOLIDINES

Chris R. Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

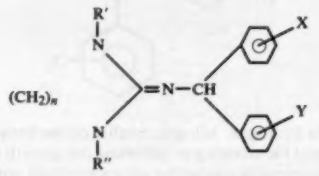
Filed Jul. 13, 1977, Ser. No. 815,393
Int. Cl.[2] A61K *31/415;* **C07D** *233/44*
U.S. Cl. 424—273 R **5 Claims**

1. A compound represented by the formula



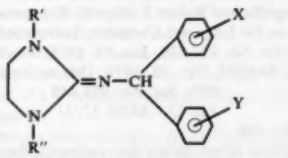
wherein R′ and R″ independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is 2, and the therapeutically active acid addition salts thereof.

3. A method for inhibiting gastric acid secretion which comprises the step of administering to a subject with gastric hyperacidity an effective antisecretory amount of a compound of the formula



wherein R′ and R″ independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo, and n is 2, and the therapeutically active acid addition salts thereof in admixture with a pharmaceutical carrier.

5. A method for reducing blood sugar which comprises the step of administering an effective hypoglycemic amount of a compound of the formula



wherein R′ and R″ independently are selected from the group consisting of hydrogen and methyl, X and Y independently are selected from the group consisting of hydrogen, lower alkoxy, lower alkyl and halo; and the therapeutically active acid addition salts thereof as active ingredient in admixture with a pharmaceutical carrier.

4,174,402

METHOD FOR THE PROPHYLAXIS OF SRS-A-INDUCED SYMPTOMS

Zigurd E. Mielens, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,616
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **12 Claims**

1. A method for inhibiting the symptoms induced by SRS-A in a mammal having an allergic condition in which SRS-A is a causative factor which comprises prophylactically administering to said mammal an amount effective for inhibiting said symptoms of a compound selected from the group consisting of 9-benzoyl-1,2,3,4-tetrahydrocarbazole-3-carboxylic acid, 9-benzoyl-6-methoxy-1,2,3,4-tetrahydrocarbazole-3-carboxylic acid, 9-benzoyl-1,2,3,4-tetrahydrocarbazole-4-carboxylic

acid, 9-(4-toluoyl)-1,2,3,4-tetrahydrocarbazole-4carboxylic acid, 9-benzoyl-6-methoxy-1,2,3,4-tetrahydrocarbazole-4-carboxylic acid and 9-benzoyl-6-methyl-1,2,3,4-tetrahydrocarbazole-4-carboxylic acid; or a pharmaceutically acceptable salt of said compound.

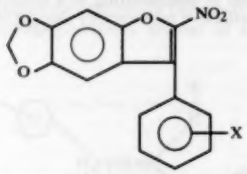
4,174,403

5,6-METHYLENEDIOXY-2-NITRO-3-PHENYLBENZOFURANS

Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Jun. 26, 1978, Ser. No. 919,415
Int. Cl.[2] A61K *31/36*
U.S. Cl. 424—282 **7 Claims**

1. A compound of the formula



wherein X is hydrogen, halogen, methyl or methoxy.

3. A method for arresting or inhibiting the growth of microorganisms comprising contacting microorganisms with a compound according to claim 1 in an amount sufficient to inhibit the growth of said microorganisms.

7. A method for arresting or inhibiting the growth of bacteria comprising contacting bacteria with a compound according to claim 1 in an amount sufficient to inhibit the growth of said bacteria.

4,174,404

DEOXYNARASIN ANTIBIOTICS

Walter M. Nakatsukasa; Gary G. Marconi; Norbert Neuss, all of Indianapolis, and Robert L. Hamill, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 917,036, Jun. 19, 1978, which is a division of Ser. No. 844,087, Oct. 20, 1977. This application Oct. 27, 1978, Ser. No. 955,448
Int. Cl.[2] A61K *31/35*
U.S. Cl. 424—283 **27 Claims**

1. The method of enhancing the contractile force of mammalian heart muscle in a warm-blooded mammal which comprises administering parenterally an effective nontoxic dose of between approximately 30 and 500 mcg/kg of body weight of a compound selected from 20-deoxynarasin and its pharmaceutically acceptable salts.

8. A feed composition adapted to fatten cattle comprising cattle feed and from 1 to 30 g per ton of a member selected from the group consisting of (1) 20-deoxy-narasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

12. A method of preventing or treating coccidiosis in poultry which comprises administering to poultry an effective anticoccidial amount of a member selected from the group consisting of (1) 20-deoxynarasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

20. A method for the control of swine dysentery which comprises orally administering to swine an amount which is effective to control swine dysentery of a member selected from the group consisting of (1) 20-deoxynarasin and its pharmaceutically acceptable salts, (2) 20-deoxy-epi-17-narasin and its pharmaceutically acceptable salts, and (3) deoxynarasin antibiotic complex.

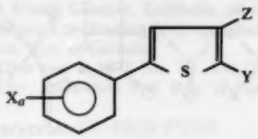
4,174,405

THIOPHENES USEFUL IN CONTROL OF ACARIDS

Douglas I. Relyea, Bethany; Winchester L. Hubbard, Woodbridge, and Robert E. Grahame, Jr., Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 691,660, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 445,378, Feb. 25, 1974, abandoned. This application Oct. 11, 1977, Ser. No. 840,687
Int. Cl.[2] A01N *9/00*; C07D *333/16, 333/12*
U.S. Cl. 424—275 **56 Claims**

1. A method of controlling acarid pests comprising contacting the acarid pests with an acaricidal amount of a substituted thiophene of the formula



where X is alkyl having 1 to 3 carbon atoms, halogen, nitro, haloalkyl having 1 to 3 carbon atoms, alkoxy having 1 to 3 carbon atoms, alkylthio having 1 to 3 carbon atoms or phenyl; a is 0, 1 or 2; Y is hydrogen, halogen, phenyl, phenylthio, nitrophenylthio, chlorophenylthio, or phenylsulfono; and Z is hydrogen or phenyl.

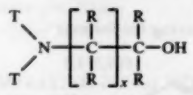
4,174,406

TERPENYLAMINOALKANOL FISH TOXICANTS

Carl Bordenca, Rocky River, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 599,244, Jul. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,907, May 10, 1974, abandoned. This application May 25, 1977, Ser. No. 800,376
Int. Cl.[2] A01N *9/20, 9/24*
U.S. Cl. 424—325 **16 Claims**

1. A process for controlling fish populations which comprises treating the water wherein said fish reside with a piscicidally effective amount of an aminoalkanol toxicant or water-soluble salt thereof, having the formula:



wherein:

T is a radical selected from the group consisting of geranyl, citronellyl, bupleuryl, neryl, lavandulyl, linalyl, myrcenyl, isobornyl and tetrahydrogeranyl;

R is independently hydrogen or lower alkyl radical containing one to four carbon atoms; and

X is an integer of 1 to 4.

4,174,407

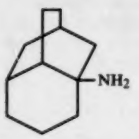
ANTIVIRAL AGENT

Masaru Fukui, Takarazuka; Shigeo Ogino, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Kao Soap Co., Ltd., Tokyo, both of, Japan

Filed Jan. 13, 1978, Ser. No. 869,144
Int. Cl.[2] A61K *31/13*
U.S. Cl. 424—325 **1 Claim**

1. A method for the treatment of viral infectious diseases caused by herpes or influenza viruses which comprises administering an amount pharmaceutically effective for the treat-

ment of said infectious diseases of 3-amino-4-homoisotwistane of the formula,



to a patient suffering from said infectious diseases.

4,174,408

DRY POWDER MIX FOR FRYING BATTER

Fred A. Wesselski, and Irving Moore, Jr., both of P.O. Box 28, Wharton, Tex. 77488

Filed Sep. 12, 1977, Ser. No. 832,652
Int. Cl.[2] A21D *10/04*
U.S. Cl. 426—302 **9 Claims**

1. A dry mix consisting essentially of:

Ingredients	Percent By Weight of Listed Ingredients
At least one farinaceous ingredient	From about 87 to about 95
Dried buttermilk	From about 3 to about 7
Dried cream	From about 1 to about 4
Dehydrated eggs	From about 1 to about 3

4,174,409

DEPOSITING LATENT FINGERPRINTS AND DEVELOPMENT THEREOF

Edward J. Goettert, Oakdale, and George Van Dyke Tiers, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 5, 1977, Ser. No. 822,066
Int. Cl.[2] A61B *5/10*
U.S. Cl. 427—1 **6 Claims**

1. The process for imprinting a latent fingerprint with extended latency on a paper substrate comprising moistening a finger with a composition consisting essentially of non-hardenable, substantially non-volatilizable, non-hygroscopic, nontoxic higher fatty polybasic acid substantive to paper and transferring a pattern from said finger to said substrate.

4,174,410

COATING AND BONDING OF METALS

Frank Smith, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 395,595, Sep. 10, 1973, Pat. No. 3,991,929. This application Sep. 16, 1976, Ser. No. 723,906
Claims priority, application United Kingdom, Sep. 22, 1972, 43897/72
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—57 **15 Claims**

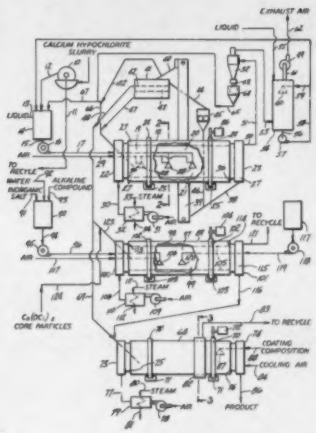
1. A method of coating the inner surface of a sheath of titanium, zirconium, tantalum or an alloy of one of these metals with a tinning metal or alloy comprising heating the sheath while the inner surface thereof is covered with the tinning metal or alloy in a molten state and moving an ultrasonically excited probe over substantially the whole of the outer surface of the sheath, the probe being in contact with said outer surface, and wherein the tinning metal or alloy is placed inside the sheath in a manner such that the outer surface of the sheath is free of tinning metal or alloy whereby the ultrasonically excited probe is out of contact with the tinning metal or alloy.

4,174,411

GRANULAR CALCIUM HYPOCHLORITE COATED WITH AN INORGANIC SALT BY SPRAY GRAINING

Walter C. Saeman, Hamden, Conn.; Noel N. Coe, West Lake, La., and John P. Faust, Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, Jul. 31, 1972, abandoned. This application Feb. 10, 1975, Ser. No. 548,653
The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.
Int. Cl.[2] C01B *11/06*
U.S. Cl. 427—214 **14 Claims**



1. A method for preparing coated, rounded particulate solid calcium hypochlorite from a pumpable and sprayable aqueous medium containing an alkali metal salt other than calcium hypochlorite in a rotary spray grainer which comprises:

(a) maintaining a moving bed of particulate solid calcium hypochlorite core particles containing from about 50 to about 85 percent available chlorine on a dry basis and from about 5 to about 30 percent by weight of water in the lower part of a distributing zone having an upper part and a lower part,

(b) maintaining a temperature in said distributing zone in the range from about 40° to about 70° C.,

(c) lifting a portion of said moving bed to said upper part and releasing said particles to separately fall through said distributing zone to said bed,

(d) spraying on said falling particles a pumpable and sprayable aqueous medium containing an alkali metal salt which is non-reactive with said calcium hypochlorite core, wherein said alkali metal salt is selected from the group consisting of chloride, chlorate, nitrate, bromide, bromate and sulfate of an alkali metal,

(f) simultaneously evaporating and removing water from said aqueous medium on said falling particles, whereby said particles are coated with a plurality of outer layers of said alkali metal salt in solid form,

(g) removing at least a portion of the resulting coated rounded solid calcium hypochlorite particles from said distributing zone,

(h) wherein said calcium hypochlorite core particles are prepared by rotary spray graining of a calcium hypochlorite slurry in a distribution zone prior to coating with said alkali metal salt, and

(i) wherein the portion of said alkali metal salt coating on said calcium hypochlorite core particles ranges from about 4 to about 45 percent by weight of said particles.

4,174,412
STRUCTURES AND STRUCTURAL MEMBERS MADE WHOLLY OR PARTLY OF WOOD

Richard G. Tyrer, Liverpool, and James Milne, Cumbria, both of England, assignors to Balfour Beatty Limited, Surrey, England

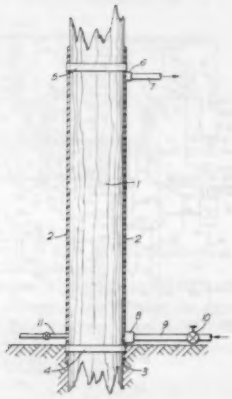
Filed Sep. 28, 1977, Ser. No. 837,438

Claims priority, application United Kingdom, Sep. 29, 1976, 40380/76

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.[2] B05D *3/00, 7/06*

U.S. Cl. 427—297 **14 Claims**



1. A method of impregnating with wood preservative at least a wooden part of a structure that is exposed to the atmosphere, which method comprises surrounding said exposed wooden part of the structure by a closely fitting, fluid-impermeable covering and sealing boundary edges of the covering to form a substantially fluid-tight enclosure; evacuating air and any other fluid from cracks and any other voids in the said wooden part of the structure and from within the fluid-tight enclosure; and allowing wood preservative in a flowable state to enter the enclosure and the cracks and other voids in said wooden part of the structure until said wooden part of the structure is fully impregnated with wood preservative.

4,174,413
MULTI-LAYERED MOLDED ARTICLES

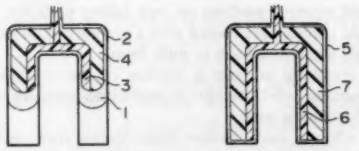
Akio Yasuike, Yokohama; Hiroshi Kataoka, Tokyo, and Norito Takao, Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,469

Claims priority, application Japan, Jul. 27, 1976, 51-89507; Nov. 1, 1976, 51-130546; Dec. 23, 1976, 51-154182; Apr. 27, 1977, 52-48971

Int. Cl.[2] B65D *23/00*; B28B *1/24*; B29F *1/00*; B32B *3/02*

U.S. Cl. 428—35 **13 Claims**



1. A multi-layered molded article having the shape of a vessel, closed-end parison, disk or the like, said article comprising in its cross-section a triple-layered structure consisting of two surface layers of different thicknesses and a core layer interposed between said surface layers, said triple-layered structure having been injection molded in a mold cavity in a single shot from two different kinds of thermoplastic synthetic resin to form said surface and core layers, respectively, said core layer having a thickness less than one half of the entire thickness of said article, said triple-layered structure having its crosssection represented by

$$a+b<\tfrac{1}{2}(a+b+c)$$

where a is the thickness of the core layer, b is the thickness of the thinner surface layer and c is the thickness of the thicker surface layer.

4,174,414
PRODUCTION OF SYNTHETIC SUEDE LEATHER

Toshimitsu Sasaki; Keikichi Fujita, both of Sennan, and Hajime Ito, Izumisano, all of Japan, assignors to Toyo Cloth Co. Ltd., Sennan, Japan

Filed Jun. 8, 1977, Ser. No. 804,604

Claims priority, application Japan, Apr. 20, 1977, 52/46093

Int. Cl.[2] B32B *5/18, 27/40, 31/18*

U.S. Cl. 428—85 **11 Claims**

1. A method for producing synthetic suede leather which comprises:

casting a mixture consisting essentially of a solution of polyurethane elastomer in an organic solvent therefor to form a structure comprising a layer of said solution between two sheets of a substrate fabric,

immersing said structure in a liquid which is a nonsolvent for said polyurethane elastomer, but miscible with said solvent, until said solvent is only partly removed from said layer and said mixture is only partly gelled,

splitting said structure into two sheets at or near the middle of said partly gelled layer, said layer being sufficiently tacky to form a fibrous pattern or texture similar to natural suede leather on each sheet, and re-immersing the resultant split sheets in said nonsolvent to complete gellation of said layer, resulting in synthetic suede leather having a long and fibrous texture.

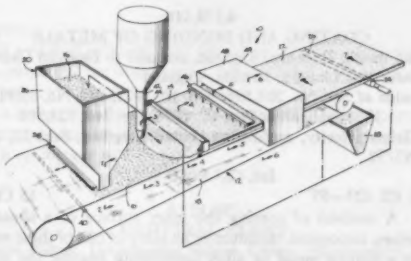
4,174,415
NO-GEL LATEX FOAM MATERIAL AND ITS PREPARATION

Eugene J. Bethe, Mishawaka, Ind., assignor to Uniroyal, Inc., New York, N.Y.

Filed Oct. 29, 1975, Ser. No. 627,153

Int. Cl.[2] B29D *27/04*

U.S. Cl. 428—90 **27 Claims**



1. A method for making no-gel latex foam comprising

(a) distributing a layer of loosely associated flock onto a water vapor-permeable supporting means,

(b) deposited a froth of uncured no-gel latex foam onto the supporting means over the flock layer to enable the froth to make surface contact with the layer of loosely associated flock, the supporting means being sufficiently layered

with flock to enable the flock to prevent the uncured froth from directly contacting the supporting means through the flock layer,

(c) heating the latex foam froth to dehydrate, cure and form the no-gel latex foam, and

(d) separating the foam from the supporting means at the flock layer, the thickness of the flock layer being controlled to permit division of the flock layer into a first portion that is adhered to the separated foam to form an exposed surface coating of flock on the foam due to adhesion between the uncured foam froth and the loosely associated flock in contact with the foam froth, and a second nonadherent portion that remains freely disposed on the supporting means, and wherein the constituents of the foam adhered surface coating of flock are of a size and material that does not prevent the no-gel latex foam from being resiliently stretchable substantially in the same manner as without the flock coating.

22. A product prepared in accordance with the method of claim 1.

4,174,416

TUBULAR PLASTICS MATERIAL NET HAVING CORRUGATIONS

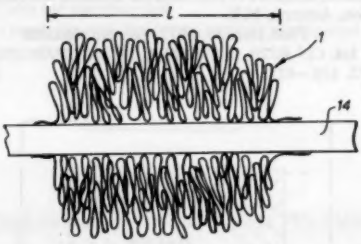
Frank B. Mercer, Blackburn, England, assignor to Netlon Limited, Lancashire, England

Filed Dec. 14, 1977, Ser. No. 860,324

Claims priority, application United Kingdom, Dec. 14, 1976, 52145/76; Mar. 22, 1977, 11950/77

Int. Cl.[2] B32B *5/12*

U.S. Cl. 428—107 **8 Claims**



5. An annular sleeve of plastics material net which has been formed by rope-orientating a tubular mesh structure comprising two sets of strands joined together by tenacious intersections, each set extending at an angle to the other set and at an oblique angle to the machine and transverse directions, and subsequently heat setting the rope-oriented net in a transversely opened-out and axially spaced corrugated state with the corrugations running transversely, the net being in a highly concentrated, axially-bunched condition, having a length less than 1/350th of its maximum axially-extended length, and having no substantial tendency to contract radially inwards into a rope form.

4,174,417

METHOD OF FORMING HIGHLY ABSORBENT FIBROUS WEBS AND RESULTING PRODUCTS

Theodore B. Rydell, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 621,840, Oct. 14, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 861,721

Int. Cl.[2] B32B *23/02*

U.S. Cl. 428—221 **14 Claims**

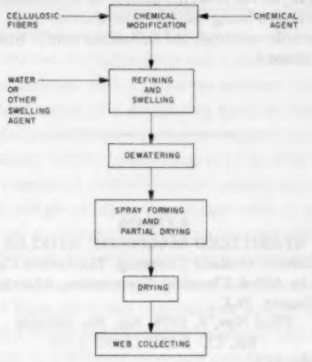
1. Method of forming a highly absorbent web comprising the steps of;

(a) forming a gel by mixing with a solvent chemically modified cellulose fibers selected from the group consisting of,

(i) cellulose that has been subjected to chemical substitution, etherization or esterification,

(ii) cellulose that has been subjected to chemical substitution, etherization or esterification and crosslinked, and

(iii) cellulose that has been polymeric grafted, without dissolving said fibers to the extent that they are not identifiable,



(b) removing from said gel mixture external solvent to the extent that the total amount remaining is within the range of ±5 grams per gram of fiber of the fiber saturation point,

(c) spraying said gel mixture to separate said fibers,

(d) collecting said fibers as sprayed into a web having a high degree of "z" direction fiber orientation, and

(e) drying said fibers.

4,174,418

ANTIBACTERIAL TEXTILE FINISHES UTILIZING ZIRONYL ACETATE COMPLEXES OF INORGANIC PEROXIDES

Clark M. Welch, Metairie; Gary F. Danna, New Orleans, both of La., and Tyrone L. Vigo, Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 787,177, Apr. 12, 1977, Pat. No. 4,115,422. This application May 31, 1978, Ser. No. 911,029

Int. Cl.[2] B32B *23/00;* **B05D** *3/00, 3/02*

U.S. Cl. 428—264 **11 Claims**

1. A one-bath process for rendering cellulosic textiles bacteriostatic, which process comprises:

(a) preparing an aqueous treating solution containing about from 1% to 35% zirconyl acetate, 0.3% to 35% acetic acid, and 1% to 25% of an inorganic peroxide selected from the class consisting of hydrogen peroxide, an alkali metal perborate monohydrate and an alkali metal perborate tetrahydrate, the solution being made up by adding the inorganic peroxide to a solution of the zirconyl acetate and acetic acid in water, the ratio by weight of acetic acid to zirconyl acetate being from about 0.3:1 to about 5:1, and the mole ratio of zirconyl acetate to inorganic peroxide being from about 0.1:1 to about 3:1,

(b) immersing a cellulosic textile in the aqueous treating solution for a period of time sufficient to thoroughly wet the cellulosic textile,

(c) removing excess treating solution from the cellulosic textile,

(d) heating the cellulosic textile at a temperature of about from 50° C. to 160° C. for about from 0.5 minutes to 30 minutes to dry the cellulosic textile and cause deposition of peroxide complexes of zirconium on the textile, the higher temperatures being maintained for the shorter times,

(e) washing the cellulosic textile to remove excess reagents, and

(f) drying the treated cellulosic textile at a temperature of 50° C. to 140° C. for from 0.5 minute to 30 minutes, the higher temperatures being used for the shorter times.

4. As a textile material, the cellulosic textile treated by the process of claim 1.

4,174,419

STABILIZED MAGNETIC SHIELDS

Louis F. Nienart, Holland Township, Hunterdon County, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 8, 1978, Ser. No. 959,026
Int. Cl.[2] B32B *15/00, 5/18*
U.S. Cl. 428—313 **16 Claims**

1. A magnetic composite structure comprising a superposed layer adhesively bonded to a glassy metal alloy sheet.

3. The composite structure as set forth in claim 1 wherein the superposed layer is a polymer foam.

4,174,420

UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE

Colin Anolick; Vivian M. Robinson, both of Wilmington, and Charles W. Stewart, Sr., Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1975, Ser. No. 572,709
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—310 **37 Claims**

13. Furniture upholstery fabric having improved flame resistance, said fabric having integrally attached to it a layer of neoprene foam which contains, in parts by weight per 100 parts by weight of the neoprene, about 5–15 parts of a char promoter selected from the group consisting of urea/formaldehyde resins, melamine/formaldehyde resins, melamine phosphate, phthalic anhydride, pyromellitic anhydride, sodium borate, calcium borate, zinc borate, and boric acid and a hydrated inorganic compound containing an amount of hydration water equivalent to 10–180 parts of alumina hydrate, said hydrated inorganic compound retaining most of its hydration water at the foam drying and curing temperatures but losing it below about 500° C.;

the neoprene being a homopolymer of chloroprene or a copolymer of chloroprene with another ethylenically unsaturated organic monomer, the proportion of such other monomer being at most about 20 weight percent of the total polymer;

with the proviso that when the neoprene is a copolymer of chloroprene with acrylonitrile or with an α,β-unsaturated carboxylic acid, the proportion of acrylonitrile or of the α,β-unsaturated carboxylic acid is such that the proportion of the copolymer weight which is contributed by the nitrile or carboxyl groups is about 2–20 percent, and the char promoter may be absent.

4,174,421

PIEZOELECTRIC CRYSTALLINE FILM OF ZINC OXIDE AND METHOD FOR MAKING SAME

Hiroshi Nishiyama, Mukou; Toshio Ogawa, and Tasuku Mashio, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 7, 1978, Ser. No. 940,336
Claims priority, application Japan, Sep. 13, 1977, 52-110894; Sep. 17, 1977, 52-111763
Int. Cl.[2] C23C *15/00;* **C04B** *35/00*
U.S. Cl. 428—432 **6 Claims**

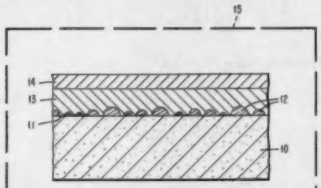
1. A piezoelectric crystalline film on a substrate, the film being a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the substrate surface, characterized in that said crystalline zinc oxide film contains, as additive elements, vanadium and manganese; the content of each of said additive elements being 0.01 to 20.0 atomic percent; said film being smooth and having good adhesion to said substrate.

4,174,422

GROWING EPITAXIAL FILMS WHEN THE MISFIT BETWEEN FILM AND SUBSTRATE IS LARGE

John W. Matthews, decreased, late of Ossining, N.Y. (by Valerie A. Matthews, executrix), and William M. Stobbs, Cambridge, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,088
Int. Cl.[2] B32B *15/04;* **H01L** *21/205, 21/84, 29/26*
U.S. Cl. 428—621 **10 Claims**



1. A structure composed of laminations of several materials including a substrate having a surface of a first single crystal material comprising monocrystalline NaCl,

an intermediate layer of a plurality of Ni crystal islands deposited in epitaxial alignment on said surface of a first single crystal material said islands covering less than about 30% of said substrate, and

an upper layer of monocrystalline epitaxial Ag crystals deposited in the form of a single crystal upon said surface and said intermediate layer with a substantial lattice misfit between said third material and said first single crystal material.

6. A method of producing a thin epitaxial monocrystalline film of a metal including

providing a substrate having a deposition surface composed of a monocrystalline NaCl structure,

forming epitaxial crystal islands of an intermediate material comprising Ni structures on said NaCl structure, said islands covering less than about 30% of said substrate, and

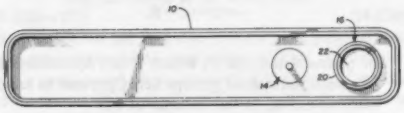
vacuum depositing said epitaxial monocrystalline film of Ag crystals upon said deposition surface covered with said islands of an intermediate material.

4,174,423
Patent Not Issued For This Number

4,174,424
SEAL ARRANGEMENT FOR FACILITATING HERMETICITY LEAKAGE TESTING

Edsel O. Jurva, Anoka, and Howard D. Mosman, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 21, 1978, Ser. No. 917,595
Int. Cl.[2] H01M *2/00*
U.S. Cl. 429—90 **10 Claims**



1. An inner and outer seal arrangement for facilitating the leak testing of hermetically sealed containers, comprising:
an opening in the container for receiving the seal arrangement;
an inner plug member of elastomeric material interference-fitted into the opening; and
an outer hermetic seal closing the opening and spaced from the inner plug member.

4,174,425
PROCESS OF PREPARING STYRENIC POLYMER FOAMS

Fumio Saito, Ohtsu; Fumito Yamai, Kusatsu; Yositugu Beppu, Shiga, and Shinpei Nakayama, Kusatsu, all of Japan, assignors to Sekisui Kasehin Kogyo Kabushiki Kaisha, Nara and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Division of Ser. No. 596,785, Jul. 17, 1975, Pat. No. 4,091,054, which is a continuation-in-part of Ser. No. 381,459, Jul. 23, 1973, abandoned. This application Jan. 11, 1978, Ser. No. 868,591
Int. Cl.[2] C08J *9/02*
U.S. Cl. 521—56 **14 Claims**

1. In a suspension polymerization process for preparing foamable styrenic polymer particles from a styrenic monomer and styrenic polymer particles having particle sizes in a definite particle size range which comprises suspending the styrenic polymer particles in water containing a surface active agent and a suspending agent selected from the group consisting of a water-soluble high molecular weight material and a slightly soluble inorganic material and adding to the aqueous suspension the styrenic monomer and a suspension polymerization catalyst to cause the polymerization, the improvement which comprises reducing the amount of powdery polymer particles which pass through a 32 mesh sieve to thereby obtain said styrenic polymer particles having a uniform particle size by adding:

(1) a polymerization catalyst suspension prepared from a polymerization catalyst solution comprising (a) 100 to 60% by weight of the suspension polymerization catalyst selected from the group consisting of organic peroxides, azo compounds and mixtures thereof and (b) 1 to 10% by weight of styrene monomer with up to 50% by weight of a different monomer copolymerizable therewith selected from the group consisting of methylacrylate, ethylacrylate, butylacrylate, methylmethacrylate, ethylmethacrylate, dimethylmaleate, diethylmaleate, acrylonitrile, α-methylstyrene, divinylbenzene and a mixture thereof having been admixed with an aqueous solution containing an emulsifying agent or a suspending agent to form a finely suspended polymerization catalyst suspension; and
(2) a monomer solution comprising (a') 0 to 40% by weight of the suspension polymerization catalyst and (b') 99 to 90% by weight of styrene monomer with up to 50% by weight of a different monomer copolymerizable therewith, dropwise and simultaneous but separately from each other to the aqueous suspension of the polymer particles selected from the group consisting of styrene homopolymer and a copolymer of styrene monomer and up to 50% by weight of a different monomer copolymerizable therewith selected from the group consisting of an acrylic ester, a methacrylic ester, a maleic ester and a fumaric ester wherein the alcohol moiety is an alkyl group having 1 to 12 carbon atoms, to cause the polymerization, and conducting the polymerization in the presence of a foaming agent which does not dissolve or at most slightly swells the styrenic polymer particles produced; the amount of said styrene monomer and styrene homopolymer or copolymer being 95 to 40% by weight and 5 to 60% by weight, respectively, based on the total amount thereof; and the particle size of said styrene homopolymer or copolymer being about 0.2 to 1.8 mm.

4,174,426
METHOD OF IMPROVING CHARACTERISTIC OF CATION-EXCHANGE MEMBRANE BY SWELLING IN WATER MISCIBLE ORGANIC SOLVENT AND TREATING FURTHER WITH HYDROCHLORIC ACID

Shunichi Asami; Toru Seita, and Akihiko Shimizu, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jun. 7, 1978, Ser. No. 913,364
Claims priority, application Japan, Jun. 13, 1977, 52-68883
Int. Cl.[2] B01D *15/04*; C08F *14/18*; C08J *5/22*
U.S. Cl. 521—27 **10 Claims**

1. A method of improving characteristic of a cation-exchange membrane which comprises swelling a homogeneous cation-exchange membrane made of one or more fluorinated polymer having cation-exchangeable groups with a water miscible organic solvent and then removing said organic solvent from the swollen membrane and then, treating the membrane with hydrochloric acid at from 40° to 95° C.

4,174,427

METHOD OF MAKING EXPANDABLE POLYSTYRENE BEADS

Pauls Davis, Gibraltar, Mich.; Herbert H. Gahmig, Bad Dürkheim, Fed. Rep. of Germany, and Irving R. Schmolka, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 21, 1978, Ser. No. 927,175
Int. Cl.[2] C08J 9/22
U.S. Cl. 521—56 2 Claims

1. In making beads of expandable-polystyrene destined for container use from a recipe including styrene, free-radical initiator, and polyvinyl pyrrolidone, the improvement comprising washing the beads for about 3 to 10 hours at a temperature of about 40–55 degrees Centigrade in an aqueous solution of a hydrophilic alkoxylated nonionic surfactant which is solid at room temperature and has a molecular weight, 70–90 percent of which is accounted for by oxyethylene units, said surfactant being present in said aqueous solution in an amount between 0.001 and 1%, said amount being effective to cause said washing to remove contaminating grafted polyvinyl pyrrolidone from the surface of said beads and cause said beads to become expandable into impervious product containers.

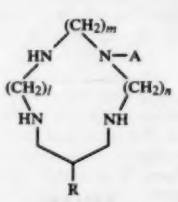
4,174,428

HEAVY METAL ION ADSORBENTS

Iwao Tabushi, No. 15-27, 3-chome, Maidashi, Higashi-ku, Fukuoka-shi, Fukuoka-ken, Japan; Hidefumi Kato, Kurume, Japan; Yoichi Taniguchi, Ogori, Japan, and Yasuhisa Kuroda, Osaka, Japan, assignors to Iwao Tabushi, Kyoto, Japan

Filed Jan. 30, 1978, Ser. No. 873,513
Claims priority, application Japan, Mar. 9, 1977, 52/24884; Mar. 9, 1977, 52/24885; Mar. 9, 1977, 52/24886
Int. Cl.[2] C08F 8/00; C07D 257/02
U.S. Cl. 525—334 14 Claims

1. A heavy metal ion absorbent represented by the formula:



wherein l, m and n are 2 or 3, respectively; R is an alkyl group containing 4 to 6 carbon atoms which is substituted by an amino group in the ω-position; and A is hydrogen or polystyrene.

4,174,429

PROCESS FOR POLYMERIZING OLEFINS

Umberto Giannini; Enrico Albizzati, both of Milan; Sandro Parodi, Oleggio, and Franco Pirinoli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Division of Ser. No. 670,951, Mar. 26, 1976, Pat. No. 4,124,532.
This application Aug. 23, 1978, Ser. No. 936,630
Claims priority, application Italy, Mar. 28, 1975, 21815 A/75
Int. Cl.[2] C08F 4/66, 10/00
U.S. Cl. 526—114 4 Claims

1. Process for polymerizing or copolymerizing olefins, which comprises effecting the polymerization or copolymerization in the presence of a catalyst prepared by mixing

(1) a catalyst component having the formula

$$M_mM'X_{2m}Y.nE$$

in which

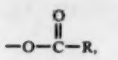
M=at least one metal selected from the group consisting of Mg, Mn and Ca;

m=a number from 0.5 to 2;

M'=at least one metal selected from the group consisting of Ti, V and Zr;

X=Cl, Br or I;

Y=a radical selected from the group consisting of halogen, the groups $-NR_2$, $-OR$, and



or mixtures thereof, in which R is a hydrocarbon radical, such radicals or groups being present in an amount corresponding to the valence of M';

n=a number from 0.5 m to 20 m; and

E=a hydrocarbyl electron-donor compound selected from the group consisting of (a) esters of organic carboxylic acids; (b) amines; (c) esters of carbonic acid; (d) nitriles; (e) phosphoramides; (f) esters of phosphoric and phosphorous acid and (g) phosphorus oxychloride; with

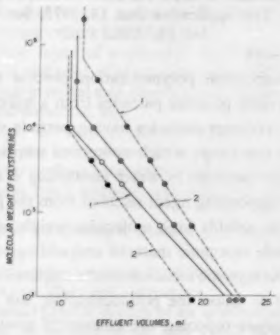
(2) an alkyl Al compound.

4,174,430

PROCESS FOR PRODUCING POROUS POLYSTYRENE GEL

Shiro Kido; Tetsuo Yokota, and Yasuhiro Nakahara, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 24, 1978, Ser. No. 927,336
Claims priority, application Japan, Jul. 27, 1977, 52-89303
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—146 10 Claims



1. A process for producing a porous polystyrene gel of improved gel permeation chromatographic properties which

comprises polymerizing styrene and divinylbenzene with an inert organic solvent in an aqueous suspension polymerization, in the presence of a radical polymerization catalyst, wherein said catalyst is present in an amount of more than 5 mole % of the total amount of styrene and divinyl benzene.

4,174,431

PROCESS FOR POLYMERIZING CONJUGATED DIENES

Adel F. Halasa, Bath; James E. Hall, Akron, and Donald N. Schulz, Hartville, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 848,958, Nov. 7, 1977, Pat. No. 4,139,490. This application Aug. 25, 1978, Ser. No. 937,007

Int. Cl.[2] C08F *4/50, 4/54, 4/08*

U.S. Cl. 526—173 **14 Claims**

1. The process for the hydrocarbon solution polymerization of a monomer composition containing at least 70 percent by weight of a conjugated diene comprising the steps of maintaining said monomer at a temperature of 0°–150° C. and in intimate contact with the catalyst composition comprising

(a) a dihydrocarbyl magnesium compound in which the hydrocarbyl radicals have 1–10 carbon atoms selected from the class consisting of alkyl, carbocyclic aryl and cycloalkyl radicals, and

(b) an alkali metal compound of the formula $R(SM)_n$ or RC=CM, wherein M represents Li, Na, or K; R represents a hydrocarbyl radical of 1–10 carbon atoms; and n represents 1, 2, or 3;

the concentrations of the respective components giving an Mg/alkali metal molar ratio of 0.01/1 to 100/1, said magnesium compound being present in a concentration of 0.1–10 millimoles per 100 grams of monomer.

4,174,432

FLAME RETARDANT RIGID THERMOPLASTIC FOAMS

George E. Niznik, Lanesboro, Mass., assignor to General Electric Company, Schenectady, N.Y.

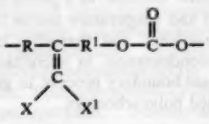
Continuation-in-part of Ser. No. 908,553, May 22, 1978, which is a continuation-in-part of Ser. No. 669,027, Mar. 22, 1976, abandoned. This application Feb. 8, 1979, Ser. No. 10,496

Int. Cl.[2] C08J *9/08, 9/10*

U.S. Cl. 521—180 **8 Claims**

1. Shaped flame retardant rigid thermoplastic foams having a density of 0.5 g/cc to 1.2 g/cc, and a Gardner Impact Strength of at least 10 ft-lbs, which is the product obtained by injection foam molding the melt of a blend comprising by weight

(A) from 5–100% of a thermoplastic haloethylene polycarbonate having an intrinsic viscosity of at least 35 dl/g and consisting essentially of chemically combined units of the formula,



and correspondingly

(B) from 0–95% of a thermoplastic polycarbonate, where R and R^1 are divalent aromatic radicals having from 6–13 carbon atoms, X is a halogen atom and X^1 is selected from X and hydrogen.

4,174,433

POLYHYDROXYL COMPOUNDS CONTAINING GUANIDINE GROUPS USEFUL IN PREPARATION OF POLYURETHANE FOAMS

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

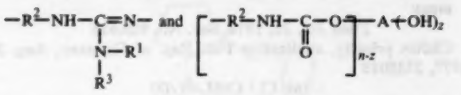
Filed Mar. 23, 1978, Ser. No. 889,463

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714292

Int. Cl.[2] C08G *18/06*

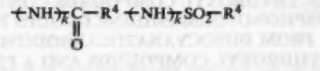
U.S. Cl. 528—49 **9 Claims**

1. Compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

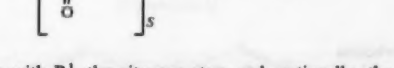
R^1 represents hydrogen or C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group consisting of hydroxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine or R^1 represents one of the radicals:



or R^1 together with R^3 and the nitrogen atom forms a 5- or 6 membered heterocyclic ring optionally containing as additional hetero atoms an oxygen atom or up to two nitrogen atoms;

R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical containing from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

R^3 represents a monovalent or — in the form of a bridge to other guanidine groups — divalent or trivalent C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally contain one or two substituents selected from the group of hydroxyl, alkoxyl, mercapto, secondary amino, sulphonic acid ester, phosphonic acid ester, carboxylic ester, siloxane, trifluoromethyl or nitrile groups, fluorine, chlorine, bromine or iodine; or one of the radicals:



or together with R^1, the nitrogen atom and, optionally, the nitrogen atom of another guanidine group forms a 5- or 6-membered heterocyclic ring optionally containing as an additional hetero atom an oxygen or nitrogen atom;

R^4 represents an aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

R^5 represents an s-valent aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 15 carbon atoms;

A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl com-

pound having a molecular weight of from 62 to 6000;
represents an integer of from 2 to 8 represents an integer of from 1 to 3;
represents an integer having a value of from 0 to (n−1); and
k represents 0 to 1.

4,174,434

COMPOUNDS CONTAINING HYDROXYL GROUPS AND URETHANO-ARYL-SULFONIC ACID GROUPS

Dieter Dieterich; Gerhard Balle, both of Leverkusen, and Hans G. Schmelzer, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,615

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735013

Int. Cl.[2] C08L *81/00*

U.S. Cl. 528—69 **10 Claims**

1. Compounds having an average molecular weight of from 300 to 12,000, containing: at least one hydroxyl group and at least one urethano-aryl-sulfonic acid group.

4,174,435

POLYHYDROXYL COMPOUNDS CONTAINING PHOSPHONOFORMAMIDINE GROUPS PREPARED FROM DIISOCYANATOCARBODIIMIDES, POLYHYDROXYL COMPOUNDS AND A PHOSPHITE

Walter Schäfer, Cologne; Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

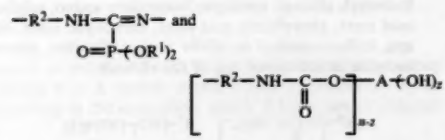
Filed Mar. 23, 1978, Ser. No. 889,329

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714289

Int. Cl.[2] C08G *18/06*

U.S. Cl. 528—70 **9 Claims**

1. Compounds containing at least two terminal hydroxyl groups and having a molecular weight of from 400 to 15,000, which compounds comprise segments in their molecular structure corresponding to the following general formulae:



wherein

R^1 represents a C_1–C_{18} aliphatic, C_4–C_{15} cycloaliphatic or C_6–C_{15} aromatic or araliphatic radical which may optionally contain a double bond and/or be branched and which may optionally be substituted by a group selected from the group of hydroxyl or trifluoromethyl groups, fluorine, chlorine, bromine or iodine;

R^2 represents a divalent aliphatic, cycloaliphatic, aromatic or araliphatic radical having from 4 to 25 carbon atoms obtained by removing the isocyanate groups from a diisocyanate;

A represents an n-valent radical of the type obtained by removing the hydroxyl groups from a polyhydroxyl compound having a molecular weight of from 62 to 6000;

n represents an integer of from 2 to 8; and

z represents an integer having a value of from 0 to (N−1).

4,174,436

POLYURETHANES AND FOOD CASINGS MADE THEREFROM

Rudi Koriatzki, Laudenbach, and Günter Schumacher, Weinheim, both of Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Co., Weinheim, Fed. Rep. of Germany

Division of Ser. No. 753,694, Dec. 23, 1976, Pat. No. 4,123,589. This application Jul. 20, 1978, Ser. No. 926,541

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559318

Int. Cl.[2] C08G *18/42*; B32B *27/40*; A22C *13/00*

U.S. Cl. 528—80 **18 Claims**

1. A polyurethane elastomer exhibiting thermoplastic properties on processing, the polyurethane consisting essentially of base units derived from the reaction of

(a) at least one high molecular weight diol,

(b) at least one di-isocyanate, and

(c) at least one low molecular weight glycol as chain-extender, both the base units derived from both the high molecular weight diol and the di-isocyanate consisting essentially of linear C_6-aliphatic units, the equivalent ratio of high molecular diol to di-isocyanate base units being in the range of approximately 1:3.5 to 1:70, the quantity-weight ratio of said base units being in the range of from approximately 1:0.4 to 1:4.0, respectively, the equivalent ratio of the low molecular glycol to high molecular diol being from approximately 5:1 to 70:1, the chain extender comprising no more than approximately 50 mole-% of linear C_6-aliphatic units.

4,174,437

PROCESS FOR THE PREPARATION OF BRANCHED POLYCARBONATES

Karsten Idel; Dieter Freitag, and Werner Nouvertné, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 894,229

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718466

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—199 **15 Claims**

1. Process for the preparation of branched thermoplastic polycarbonates, characterized in that diphenols are completely reacted with about 0.05 to about 2.0 mol %, relative to mols of diphenols, of cyanuric chloride in a primary reaction, while controlling the pH and temperature and in the presence of a water miscible co-solvent, and thereafter the products are subjected to polycondensation, in accordance with known methods of the phase boundary process, to give high-molecular weight, branched polycarbonates.

4,174,438

Patent Not Issued For This Number

4,174,439

PROCESS FOR ISOLATING GLUCOPYRANOSE COMPOUND FROM CULTURE BROTHS

Erich Rauenbusch, and Delf Schmidt, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,263

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719912

Int. Cl.[2] C07H *15/20*

U.S. Cl. 536—18 **17 Claims**

1. A process for isolating an amino sugar derivative which is 0-{4,6-dideoxy-4[[1S-(1,4,6/5)-4,5,6-trihydroxy-3-hydroxymethyl-2-cyclohexen-1-yl]-amino]-α-D-glucopyranosyl}-(1→4)-0-α-D-glucopyranosyl-(1→4)-D-gluco pyranose from a culture broth obtained by fermenting a micro-organism of the family Actinoplanaceae which comprises

(a) adding a mixture of a strongly acid cation exchange resin and an anion exchange resin in the acid or basic form to the said culture broth,

(b) separating the resin mixture from the culture filtrate and from any mycelium that may be present,

(c) treating the separated off resin mixture with at least one cation containing dilute solution so as to elute the amino-sugar derivative,

(d) passing the resulting eluate over a combination of a highly crosslinked strongly acid cation exchanger, which weakly bonds the amino-sugar derivative in the $H^{\oplus}$ form and an anion exchanger in the basic form,

(e) passing the eluate over a strongly acid cation exchanger, which bonds the amino-sugar derivative strongly in the $H^{\oplus}$ form,

(f) treating the cation exchanger with the amino-sugar derivative bonded thereto with from 0.01 to 0.05 N mineral acid so as to fractionally elute material bound to the exchanger in a plurality of fractions, and then

(g) recovering the fraction(s) containing said amino-sugar derivative.

4,174,440

IONIC PULLULAN GELS AND PRODUCTION THEREOF

Fumio Fujita, Osaka; Kousuke Fukami; Masanori Fujimoto, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 27, 1978, Ser. No. 890,505

Claims priority, application Japan, Apr. 1, 1977, 52-37787

Int. Cl.[2] C07H *15/04*

U.S. Cl. 536—120 **8 Claims**

1. A process for producing ionic pullulan gels characterized by the steps of (1) reacting pullulan with a compound of the formula,

$$X_1—R_1—Y$$

wherein X_1 and Y are each a halogen atom or an epoxy group, and R_1 is an aliphatic group having 1 to 30 carbon atoms which may have 1 to 2 hydroxyl groups or an oxygen atom in the carbon chain, in the presence of an alkali metal hydroxide or organic amine, and then (2) reacting the resulting crosslinked water-swellable pullulan gel with a compound selected from the group consisting of 2-dimethylaminoethyl chloride, 2-diethylaminoethyl chloride, 2-dimethylaminoisopropyl chloride, 2-bromo-5-diethylaminopentane, 2-diphenylaminoethyl chloride, 2-(N,N-dimethylphenylamino)ethyl chloride, 3-amino-1,2-epoxypropane, 3-dimethylamino-1,2-epoxypropane, 3-diethylamino-1,2-epoxypropane, 3-dibutylamino-1,2-epoxypropane, 3-diphenylamino-1,2-epoxypropane, 3-(N,N-dimethylphenylamino)-1,2-epoxypropane, N,N-(2,3-epoxypropyl)methylaniline, inorganic acid salts or alkyl halide salts thereof, chloroacetic acid, bromoacetic acid, chloropropionic acid, salts thereof, chloromethanesulfonic acid, bromoethanesulfonic acid, chloroethanesulfonic acid and salts thereof in the presence of an alkali metal hydroxide, alkaline earth metal hydroxide or organic amine.

4,174,441

PYRAN ANALOGS OF 5-HYDROXY-PGI$_1$

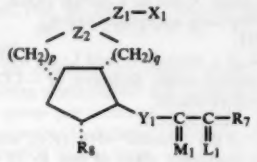
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,197

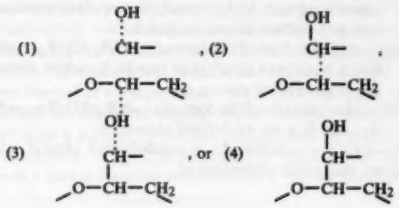
Int. Cl.[2] C07D *311/94*

U.S. Cl. 542—426 **94 Claims**

1. A prostacyclin analog of the formula



wherein Z_2 is



wherein one of p or q is the integer one and the other is the integer zero;

wherein Z_1 is

(1) $—(CH_2)_g—CH_2—CH_2—$,

(2) $—(CH_2)_g—CH_2—CF_2—$, or

(3) trans$—(CH_2)_g—CH=CH—$,

wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

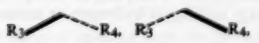
(3) $—CH_2CH_2—$,

(4) trans—CH=C(Hal)—, or

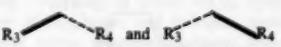
(5) —C≡C—

wherein Hal is chloro or bromo;

wherein M_1 is



or a mixture of

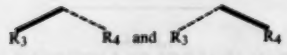


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;

wherein L_1 is

or a mixture of

-continued



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_1 is

(1) $—COOR_1$; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation,

(2) $—CH_2OH$,

(3) $—CH_2NL_2L_3$, wherein L_2 and L_3 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or $—COOR_1$, wherein R_1 is as defined above;

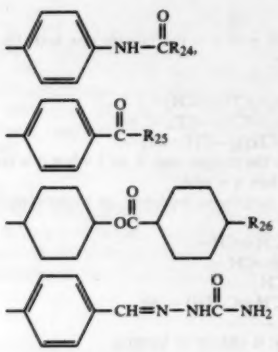
(4) $—COL_4$, wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl or one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;

(b) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl or one to 4 carbon atoms and R_{21} is as defined above; or

(c) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

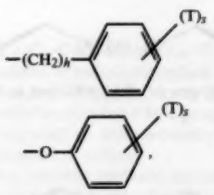
(5) $—COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{25} is methyl, phenyl, $—NH_2$, of methoxy; and R_{26} is hydrogen or acetamido; and

wherein R_7 is

(1) $—(CH_2)_3—CH_3$,



(2)

(3)

wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl and the 1,5- and 1,15-lactones thereof.

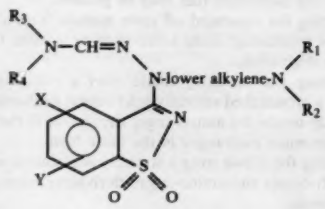
4,174,442

SUBSTITUTED HYDRAZINO DERIVATIVES OF BENZISOTHIAZOLE-1,1-DIOXIDES

Peter C. Wade, Pennington, and Thomas P. Kissick, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1978, Ser. No. 875,020
Int. Cl.[2] C07D *275/06*; A61K *31/425*
U.S. Cl. 544—62 **4 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3 and R_4 each is lower alkyl or together with the nitrogen form a pyrrolidino, morpholino, thiamorpholino, piperidino or N-lower alkylpiperazino radical;

X is hydrogen, halogen, lower alkyl, lower alkoxy or nitro, X being the same as Y when

Y is other than hydrogen;

Y is hydrogen, lower alkoxy or halogen;

and non-toxic physiologically acceptable acid addition salts thereof.

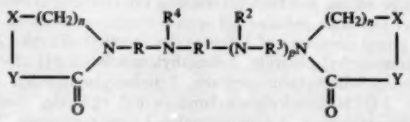
4,174,443

AZA-BIS-LACTAMS

Philip B. Dalton, Brookville, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,857
Int. Cl.[2] C07D *241/08, 265/32, 207/26*
U.S. Cl. 544—86 **17 Claims**

1. An aza-bis-lactam having the formula:



wherein n is an integer from 1 to 3; p is 0 or 1; R^2 and R^4 are independently hydrogen, alkyl having from 1 to 4 carbon atoms or phenyl; X is methylene, an oxygen atom or $—N<R^2$; Y is methylene or, when X is methylene, then Y can also be $—N<R^2$; and R, R^1 and R^3 are independently alkylene having from 2 to 6 carbon atoms.

4,174,444

PROCESS FOR PREPARING CYANURIC ACID

Marinus J. A. M. den Otter, Munstergeleen; Lambertus P. G. Hawinkels, Montfort, and Augustinus P. H. Schouteten, Maastricht, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 703,657, Jul. 8, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,843

Int. Cl.[2] C07D *251/32*

U.S. Cl. 544—192 5 Claims

1. In a process for the preparation of cyanuric acid by heating a reaction solution of urea, biuret, or mixtures thereof, in a solvent and stripping the solution with a stripping gas to remove ammonia therefrom, the improvement which comprises employing waste gas resulting from heating said reaction solution as the stripping gas by recycling at least 60% by volume of said waste gas to the reaction solution.

4,174,445

PREPARATION OF ARTHROPODICIDALLY ACTIVE SUBSTITUTED TRIAZINE-2,4-DIONES

Edgar Mohring, and Peter Roessler, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

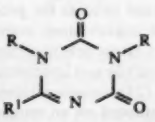
Filed Oct. 5, 1977, Ser. No. 839,694

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648120; May 23, 1977, 2723119

Int. Cl.[2] C07D *251/16*

U.S. Cl. 544—223 9 Claims

1. A substituted triazine-2,4-dione of the formula



in which

R in both instances is identical and represents alkyl with up to 20 carbon atoms carrying one or more substituents selected from the group consisting of halogen, CN, aryloxy, alkoxy, halogenalkoxy, alkylmercapto, halogenalkylmercapto or represents furthermore phenyl carrying one or more substituents selected from the group consisting of halogenoalkyl, optionally halogen-substituted phenoxy, alkoxy, halogenoalkoxy, alkylmercapto, alkoxycarbonylalkenyl and halogenoalkylmercapto radicals and which can optionally be further substituted by halogen, or represents phenylsulphonyl which is optionally substituted by halogen, nitro, CN, monoalkylamino, dialkylamino, alkylmercapto or alkoxy, or represents alkylsulphonyl which is optionally substituted by halogen or CN, and

R^1 represents hydrogen or alkyl with 1–10 carbon atoms or cycloalkyl with 5–10 carbon atoms, either of which is optionally substituted by halogen, alkoxy, cyano or nitro, or represents phenyl or naphthyl which are optionally substituted by halogen, nitro, cyano, alkyl with 1–10 carbon atoms, halogenoalkyl, alkoxy or alkylmercapto.

4,174,446

PROCESS FOR THE PREPARATION OF N^1-(2'-FURANIDYL)-5-FLUORO-URACIL

Eva Schönberger, Givatayim; Zabar Sasson, Rehovoth, and Uri Michael, Natanya, all of Israel, assignors to ABIC Ltd., Israel

Filed Oct. 11, 1977, Ser. No. 841,023

Claims priority, application Israel, Oct. 12, 1976, 50671

Int. Cl.[2] C07D *405/04*

U.S. Cl. 544—313 9 Claims

1. Method of producing N^1-(2'-furanidyl)-5-fluorouracil which comprises reacting 2,3-dihydrofuran with water in the presence of a catalytic amount of an acidic catalyst at a pH below 2.5, thereby forming a reaction mixture including unreacted starting materials, removing the unreacted starting materials and reacting the remaining reaction mixture with silylated-5-fluorouracil in the presence of a Friedel Crafts catalyst in an inert organic solvent thus forming the N^1-(2'-furanidyl)-5-fluorouracil in high yield.

4,174,447

PROCESS FOR DIMERIZATION, ARYLATION AND TRIFLUOROMETHYLATION OF AROMATIC AND HETEROCYCLIC COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 26, 1975, Ser. No. 553,093

Int. Cl.[2] C07D *401/04*

U.S. Cl. 546—109 10 Claims

1. A process for coupling compounds which comprises the steps of (1) reacting a monosilver salt compound having only one silver salt group per molecule selected from the group consisting of unsaturated, aliphatic carboxylic acids having 1 to 3 carbon-to-carbon double bonds and 3 to 26 carbon atoms, aromatic carboxylic acids, the aromatic groups of said aromatic carboxylic acids selected from the group consisting of phenyl, biphenyl, naphthyl, phenanthryi and anthranyl groups, and heterocyclic acids, the heterocyclic groups of said heterocyclic carboxylic acids being selected from the group consisting of thienyl, pyridyl, benzothienyl, thienobenzenyl, quinolyl, isoquinolyl, dibenzothienyl and phenanthridyl groups and mixtures thereof at a temperature within the range from about 100° to 500° C., (2) extracting the cooled mixture of silver and product with a solvent to recover the product by distillation or, alternatively, collecting the volatile products from the reactor in a cooled receiver and (3) recovering the silver metal.

4,174,448

PROCESS FOR THE PREPARATION OF THIENOPYRIDINE DERIVATIVES

André Bousquet, Portet, and Emile Braye, Lagardelle, both of France, assignors to Parcor, Paris, France

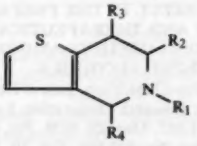
Filed Jun. 6, 1978, Ser. No. 913,073

Claims priority, application France, Jul. 12, 1977, 77 21517

Int. Cl.[2] C07D *495/04*

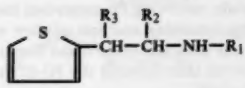
U.S. Cl. 546—114 7 Claims

1. Process for the preparation of compounds having the general formula:



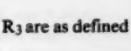
(I)

in which R_1 is a member selected from the group consisting of C_{1-7} alkyl; phenyl lower alkylene, phenyl lower alkylene in which the phenyl is substituted with 1 to 3 substituents selected from the group consisting of lower alkyl, hydroxy, lower acyloxy, lower alkoxy, nitro and halogen; naphthyl lower alkylene; thienyl lower alkylene; diphenyl lower alkylene; phenyl hydroxy-lower-alkylene; phenyl hydroxy-lower-alkylene in which the phenyl is substituted with 1 to 3 substituents selected from the group consisting of lower alkyl, hydroxy, lower acyloxy, lower alkoxy, nitro and halogen; naphthyl hydroxy-lower-alkylene; thienyl hydroxy-lower-alkylene; and diphenyl hydroxy-lower-alkylene; R_2 is selected from the group consisting of hydrogen and lower alkyl; R_3 is hydrogen; and R_4 is hydrogen, comprising reacting a compound having the formula:



(II)

in which R_1, R_2 and R_3 are as defined above, with a compound having the formula:



(III)

in which R_4 is as defined above; X is a radical selected from the group consisting of halogen, amino and substituted amino; and Y represents a radical selected from the group consisting of lower alkoxy, substituted lower alkoxy, thio(lower)alkyl, substituted thio(lower)alkyl, amino, substituted amino, and a group of the formula:

in which R is a radical selected from lower alkyl, or both the groups X and Y, together with the carbon atom to which they are attached, form a 6-membered nucleus selected from hexahydro-S—triazinic and trioxannic heterocyclic nucleus, in an inert solvent, at a temperature between 0° and 150° C. and in an anhydrous medium.

4,174,449

PROCESS FOR THE REDUCTION OF QUINIDINONE TO QUINIDINE

Jean P. Gignier, 4 Rue de Capucins, and Jacques Bourrelly, 4 Ave. de Chateau, both of 92190, Meudom, France

Filed Jun. 13, 1978, Ser. No. 915,010
Int. Cl.[2] C07D *453/04*
U.S. Cl. 546—134 **18 Claims**

1. A process for reducing quinidinone to quinidine comprising reacting quinidinone with a reducing agent selected from the group consisting of alkyl-substituted aluminum hydrides, and alkali metal alkyl-substituted aluminum hydrides in the presence of an orienting agent selected from the group consisting of pyridine, alkyl-substituted pyridine, pyrrole, and alkyl-substituted pyrrole.

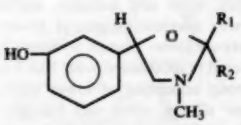
4,174,450

INTERMEDIATES USEFUL IN THE PREPARATION OF OPTICALLY AND THERAPEUTICALLY ACTIVE-m-ACYLOXYα-(METHYL-AMINO) METHYL BENZYL ALCOHOLS

Nicolae S. Bodor, and Sun-Shine Yuan, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 671,067, Mar. 29, 1976, Pat. No. 4,028,368, which is a division of Ser. No. 548,606, Feb. 10, 1975, Pat. No. 3,966,749. This application Nov. 8, 1976, Ser. No. 740,063
Int. Cl.[2] C07D *498/10*
U.S. Cl. 546—16 **6 Claims**

1. The intermediate compound:



(II)

wherein R_1 and R_2 together with the carbon atom to which they are attached form a single hetero atom member selected from the group consisting of a five- to seven-membered heterocycle containing one hetero-N-atom, and an N-substituted five- to seven-membered heterocycle containing one hetero-N-atom whose substituent is C_1-C_2 alkyl.

4,174,451

2-FURYL-(3,4-DIMETHYL-2-PYRIDYL)-CARBINOL

Ricardo Granados Jarque; Juan Bosch Cartes; Rosa Llobera Jimenëz, all of Barcelona; Cristobal Martinez Roldän, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Oct. 6, 1978, Ser. No. 949,022
Claims priority, application Spain, Oct. 7, 1977, 462.987
Int. Cl.[2] C07D *405/02*
U.S. Cl. 546—283 **6 Claims**

1. 2-Furyl-(3,4-dimethyl-2-pyridyl)-carbinol.

2. A process for obtaining 2-furyl-(3,4-dimethyl-2-pyridyl)-carbinol comprising the steps of reacting furfural with 2-bromo-3,4-dimethylpyridine in butyl-lithium at about −15° C. and isolating the product.

4,174,452

PRODUCTION OF CARBOXYLIC ACIDS FROM NITRILES

Abraham P. Gelbein, 925 Woodland Ave., Plainfield, N.J. 07060; John E. Paustian, 38 Adams Dr., Whippany, N.J. 07981, and Anthony J. Fanelli, 63 Upper Mountain Ave., Rockaway, N.J. 07866

Continuation of Ser. No. 730,386, Oct. 7, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,339
Int. Cl.[2] C07D *213/55*; C07C *63/26*
U.S. Cl. 546—319 **14 Claims**

1. In an acid catalyzed process for producing a carboxylic acid from a nitrile, the improvement comprising:

reacting water and a nitrile selected from the group consisting of (1) nicotinonitrile and intermediate hydrolysis products thereof, and (2) aromatic nitriles having at least one cyano group substituted on an aromatic nucleus selected from the group consisting of benzene and naphthalene and intermediate hydrolysis products thereof, in the vapor phase, in the presence of an acid catalyst in solid form, at a temperature of from 200° F. to 1,000° F., said temperature being above the dew point of the nitrile and corresponding carboxylic acid product to produce a gaseous effluent containing the corresponding carboxylic acid.

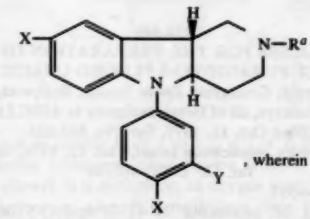
4,174,453

TRANS-HEXAHYDRO-PYRIDO-INDOLES

Joel G. Berger, Summit, N.J., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 698,589, Jun. 22, 1976, which is a continuation-in-part of Ser. No. 522,145, Nov. 8, 1974, Pat. No. 3,991,199, which is a continuation-in-part of Ser. No. 422,613, Dec. 6, 1973, abandoned. This application May 22, 1978, Ser. No. 908,572
Int. Cl.[2] C07D *471/04*
U.S. Cl. 546—85 **1 Claim**

1. A method for making trans-2,3,4,4a,5,9a-hexahydro-1H-pyrido-[4,3-b]indoles corresponding to the formula

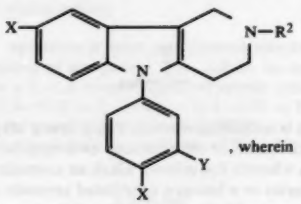


, wherein

wherein

when Y is —H, X is —H, —Cl, —Br, —CH_3, -tert—C_4H_9 or —OCH_3; and when Y is —CF_3, X is —H; and

R^a is benzyl; benzyl ring-substituted with methyl, methoxy or chloro; phenethyl; 3-phenylpropyl; 3-phenylpropyl ring-substituted with chloro, bromo, or methoxy; furfuryl; 2-thienyl; C_1–C_5 alkyl; C_3–C_7 cycloalkyl; C_4–C_8 cycloalkylmethyl; (methylcyclopropyl)methyl; (cis-2,3-dimethylcyclopropyl)methyl; exo-7-norcarylmethyl; (4-methylbicyclo[2.2.2]oct-1-yl)methyl; (bicyclo[2.2.1]hept-2-yl)methyl; 1-adamantylmethyl; or 2-adamantylmethyl, Comprising stereoselectively reducing a 2,3,4,5-tetrahydro-1H-pyrido-[4,3-b]-indole corresponding to the formula



, wherein

wherein

R^2 is the same as R^a or is

wherein

R^7 is phenyl; chlorophenyl; methylphenyl; methoxyphenyl; benzyl; phenethyl; phenethyl ring-substituted with chloro, bromo, or methoxy; 2-furyl; 2-thienyl; hydrogen; C_1–C_4 alkyl; C_2–C_4 alkenyl; C_3–C_7 cycloalkyl; methylcyclopropyl; C_5–C_7 cycloalkenyl; C_5–C_7 cycloalkadienyl; 2,3-dimethylcycloprop-2-en-1-yl; exo-7-norcaryl; 4-methylbicyclo[2.2.2]oct-1-yl; bicyclo[2.2.1]-hept-2-yl; 4-methylbicyclo[2.2.2]oct-2-en-1-yl; bicyclo[2.2.1]-hept-2-en-5-yl; 1-adamantyl; or 2-adamantyl;

by the sequential steps of

(1) reacting the tetrahydro-indole compound with boronhydride/tetrahydrofuran in the absence of acid; and

(2) acidifying the reaction product of step (1).

4,174,454
ALKYLIDENYLMETHYL-SUBSTITUTED 1-SULFONYLBENZIMIDAZOLES

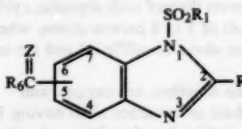
Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 750,991, Dec. 15, 1976, Pat. No. 4,118,742, which is a continuation-in-part of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Mar. 3, 1978, Ser. No. 883,113

Int. Cl.[2] **C07D** *235/30*

U.S. Cl. 548—306 **7 Claims**

1. A compound of the formula



wherein

R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R_4R_5N—, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5 when taken together with the nitrogen atom to which they are attached are pyrrolidino, piperidino or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, benzyl, phenyl, or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl;

Z is C_1–C_7 alkylidene; and

is at the 5 or 6 position.

4,174,455
ANTHRANILATES OF OXYALKYLATED CARBOXAMIDES

Jürgen Habermeier, Pfeffingen; Roland Moser, Basel, and Wolfgang Seiz, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

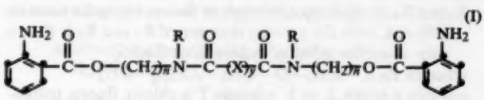
Filed Dec. 4, 1978, Ser. No. 966,417

Claims priority, application Switzerland, Dec. 9, 1977, 15123/77

Int. Cl.[2] **C07C** *101/54;* **C08G** *59/54*

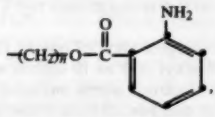
U.S. Cl. 560—49 **9 Claims**

1. An anthranilate of the formula I



(I)

wherein each R is hydrogen or



each n is the number 2, 3 or 4, y is nought or 1 and X is an alkylene radical having 1 to 8 C atoms, meta- or para-phenylene or meta- or para-cyclohexylene.

4,174,456
9-DEOXY-9-METHYLENE-INTER-OXA-13,14-DIDEHYDRO-16-PHENYL-17,18,19,20-TETRANOR-PGF_1 COMPOUNDS

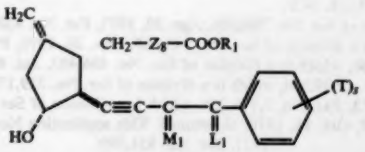
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,249, Apr. 11, 1977, Pat. No. 4,118,584. This application Jul. 12, 1978, Ser. No. 924,031

Int. Cl.[2] **C07C** *177/00*

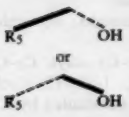
U.S. Cl. 560—60 **41 Claims**

1. A prostaglandin analog of the formula

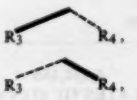


wherein

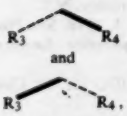
M_1 is



wherein
R_5 is hydrogen or methyl;
wherein
L_1 is



or a mixture of



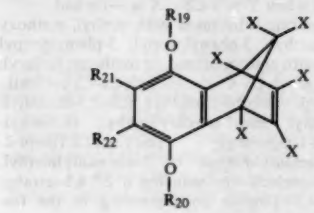
wherein
R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_8 is $—CH_2—O—CH_2—(CH_2)_g—CH_2—$
wherein g is one, 2, or 3; wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alky of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation, and the 1,11- or 1,15-lactones thereof.

4,174,457
CARBAMATE

Julian R. Little, Wayne; Walter Nudenberg, West Caldwell, and Yong S. Rim, Paterson, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

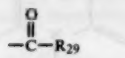
Division of Ser. No. 789,006, Apr. 20, 1977, Pat. No. 4,080,408, which is a division of Ser. No. 745,065, Nov. 26, 1976, Pat. No. 4,058,568, which is a division of Ser. No. 486,482, Jul. 8, 1974, Pat. No. 4,009,200, which is a division of Ser. No. 329,177, Feb. 2, 1973, Pat. No. 3,875,236, which is a division of Ser. No. 80,747, Oct. 14, 1970, abandoned. This application Nov. 16, 1977, Ser. No. 851,989
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—134 **3 Claims**

1. A compound of the formula:



(VII)

wherein R_{19} and R_{20} are the same or different and each may be



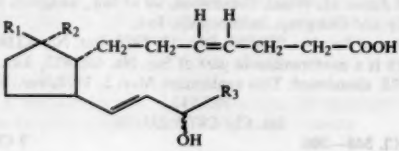
wherein R_{29} is $—NHR_{30}$ wherein R_{30} is lower alkyl, R_{21} and R_{22} can be the same or different and each may be hydrogen, $—SO_2—R_{24}$ wherein R_{24} is lower alkyl, an aromatic nucleus of the phenyl series or a halogen substituted aromatic mucleus of the phenyl series with the proviso that at least one of R_{21} and R_{22} may also be halogen; and X is halogen.

4,174,458
NOVEL ANALOGUES OF PROSTANOIC ACIDS NOT OCCURRING IN NATURE

Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain; Gerhard Beck, Frankfurt am Main, and Ulrich Lerch, Hofheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 752,433, Dec. 20, 1976, abandoned, which is a division of Ser. No. 549,651, Feb. 13, 1975. This application May 3, 1978, Ser. No. 902,404
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407186; 09241974, Sep. 24, 1974, 2445526
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—463 **2 Claims**

1. A compound of the formula



physiologically tolerated salts thereof with organic and inorganic bases, and esters thereof with aliphatic, cycloaliphatic, or araliphatic alcohols of 1 to 8 carbon atoms, wherein
R_1 and R_2, taken alone, are different and are each hydrogen or hydroxy;
R_1 and R_2, taken together, are oxygen; and
R_3 is straight chain or branched alkyl having 1 to 10 carbon atoms substituted by 0-aryl or 0-benzyl, which themselves may be substituted by one or several halogen atoms, by trifluoromethyl, by alkyl having 1 to 3 carbon atoms, by phenoxy, or by phenoxy substituted by one or several halogen atoms.

4,174,459

PROCESS FOR PRODUCING METHACRYLIC ACID

Teruhisa Sakamoto; Taketoshi Nagahama; Shigeo Nakamura, and Keiichi Kihara, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jan. 4, 1977, Ser. No. 756,912
Claims priority, application Japan, Feb. 9, 1976, 51/12245
Int. Cl.[2] C07C *51/32, 57/04*
U.S. Cl. 562—534 11 Claims

1. A process for producing methacrylic acid, which comprises:

reacting methacrolein with molecular oxygen or a molecular oxygen-containing gas in the vapor phase in the presence of a complex oxide catalyst having the formula:

$$Mo_aV_bP_cCe_dCu_eX_fO_g$$

wherein X represents at least one element selected from the group consisting of manganese, iron, cobalt, tin and tellurium and wherein a, b, c, d, e and f represent atomic ratios such that when a=12; b=0.01 to 2; c=0.1 to 3; d=0.01 to 2; e=0.01 to 2; f=0 to 2 and g assumes a value depending upon the valences of the other components in the range of 38 to 50.

4,174,460

PROCESS FOR THE HYDROXYLATION OF PHENOLS AND PHENOL ETHERS IN THE NUCLEUS

Hermann Seifert, Cologne; Helmut Waldman; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Globebusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 553,939, Feb. 28, 1975, Pat. No. 4,045,496.
This application Mar. 31, 1977, Ser. No. 783,501
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1974, 2410758
The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.
Int. Cl.[2] C07C *37/00*
U.S. Cl. 568—629 15 Claims

1. A process for the hydroxylation in the nucleus of a phenol or a phenol ether which comprises contacting a phenol or a phenol ether at the start of the reaction with substantially anhydrous hydrogen peroxide dissolved in a non-aqueous solvent which is an ester or an N-alkyl amide of phosphoric acid, phosphonic acid or phosphinic acid, employing 3 to 20 mols of phenol or phenol ether per mol of hydrogen peroxide, the reaction being carried out in the presence of a strong acid which is inert under the reaction conditions at a temperature of 20°–150° C., the acid being present in an amount of 0.01 to 2 mols per mol of hydrogen peroxide, and recovering the resulting hydroxylated phenol or phenol ether.

4,174,461

STABILIZED PERFLUOROPOLYETHER FLUIDS

Dario Sianesi; Giuseppe Nelli, both of Milan; Renzo Fontanelli, Rome, and Valentino Zamboni, Busto Arsizio, all of Italy, assignors to Montecantini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 550,293, Feb. 18, 1975, abandoned, which is a continuation of Ser. No. 294,582, Oct. 3, 1972, abandoned, which is a division of Ser. No. 156,391, Jun. 24, 1971, abandoned. This application Dec. 10, 1976, Ser. No. 749,477
Claims priority, application Italy, Jun. 27, 1970, 26668 A/70
Int. Cl.[2] C07C *43/00*
U.S. Cl. 568—582 2 Claims

1. A composition comprising (A) at least one perfluoropolyether fluid of the formula:

$$X—O—(C_3F_6O)_p—(CF_2O)_q—(C_2F_4O)_r—Y$$

wherein the perfluoroalkyleneoxy groups are randomly distributed along the chain; p, q and r are each zero or a number from 1 to 100 inclusive, the sum of p, q and r being 6 to 200; X and Y are the same or different from each other and are perfluoroalkyl groups having 1 to 3 carbon atoms; and (B) from 0.1 to 50 parts by weight per 100 parts of perfluoropolyether fluid of a perfluoropolyether compound having at least one arylamide terminal group and being of the formula:

$$A—O—(C_3F_6O)_P—(CF_2O)_Q—(C_2F_4O)_S—CF(-Z)—CO—N(R)Ar$$

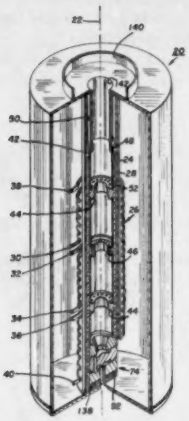
wherein if two or more of the perfluoroalkyleneoxy groups, (C_3F_6O), (CF_2O) and ($C_2Fhd\ 4^0$) are simultaneously present in the chain, they are randomly distributed therealong; and wherein A is a perfluoroalkyl group having 1 to 3 carbon atoms or a —CF(Z)—CO—N(R)Ar group; P, Q and S are each zero but not simultaneously or a number ranging from 1 to 100 inclusive, the sum of P, Q and S being 3 to 200; Z is a fluorine atom or a CF_3 group; Ar is an unsubstituted aryl group, or an aryl group which is mono-, di- or tri-substituted with a lower alkyl group, an alkylaryl group, phenyl or halogen, and R is a hydrogen atom, a lower alkyl group, an unsubstituted phenyl or phenyl group which may be bound to Ar either directly or through a sulfur atom.

4,174,462

INDUCTION FURNACES FOR HIGH TEMPERATURE CONTINUOUS MELTING APPLICATIONS

Michael L. Pearce, 741 Windsor-Perrineville Rd., East Windsor, N.J. 08520

Filed Mar. 30, 1978, Ser. No. 891,909
Int. Cl.[2] H05B 5/00
U.S. Cl. 13—26 17 Claims



1. A continuous flow induction furnace for the melting of high temperature non-conducting materials such as glasses, refractories, ceramics, or the like, said furnace having a relatively large axial length comprising:

(a) hollow, cylindrically-shaped shield means disposed along the longitudinal axis of said furnace;

(b) primary inducing means circumscribing the outer surface of said shield means and disposed along a substantial portion thereof, said inducing means being provided with means for selectively introducing varying amounts of power;

(c) hollow, cylindrically-shaped susceptor means serving as a secondary winding means for the absorption of said power and converting to heat, said susceptor being disposed within said primary inducing means and extending along said longitudinal axis for at least the length of said inducing means;

(d) powdered insulating means disposed between the outer surface of said susceptor means and the inner surface of said shield means for retaining the heat generated within the furnace; and

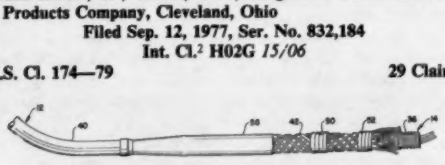
(e) hearth means, said hearth means including an orifice and insuring the continuous flow of the uncontaminated molten material.

4,174,463

CONTRACTION TERMINATION DEVICE AND METHOD

Frank Albert, Jr., Parma, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Sep. 12, 1977, Ser. No. 832,184
Int. Cl.[2] H02G 15/06
U.S. Cl. 174—79 29 Claims



1. A contraction termination device for a length of cable or the like having at least one inner strand surrounded at least by a braided sheath, said device comprising:

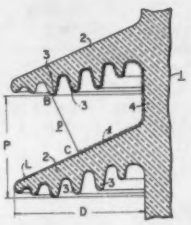
an elongated termination sleeve having opposed lead and terminal ends with an internal passageway communicating between said ends, said sleeve having an outward taper over at least a longitudinal portion thereof from said lead end toward said terminal end whereby said at least one inner strand is adapted to be received through said passageway from said lead end and said braided sheath is adapted to be received over and in surrounding relationship with at least a portion of said sleeve from said lead end; and, means for retaining said sheath over and in said surrounding relationship with said sleeve.

4,174,464

ROD-TYPE INSULATOR HAVING IMPROVED WITHSTAND VOLTAGE CHARACTERISTICS UNDER A CONTAMINATED CONDITION

Toshiyuki Kawaguchi, Inuyama, and Tomio Hayashi, Gifu, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 17, 1978, Ser. No. 897,103
Claims priority, application Japan, Apr. 28, 1977, 52-49402
Int. Cl.[2] H01B 17/56
U.S. Cl. 174—212 8 Claims



1. A rod-type insulator having a body and a plurality of adjoining sheds in an axial direction thereof and projecting from the body with the following relationships:

$$3.8 \leqq L/P \leqq 5.0;\ 4.5 \leqq l/p \leqq 6.0$$

wherein P is the pitch between the adjoining sheds, L is the leakage distance per shed, p is the distance between a given point on a lower surface of one of the adjoining sheds and another given point on an upper surface of the other opposing shed, and l is the leakage distance between the given points and, wherein the lower surface of each shed has coaxial ribs forming an undulating surface.

4,174,465

SIGNAL TRANSMITTING INTERFACE SYSTEM COMBINING TIME COMPRESSION AND MULTIPLEXING

Lawrence G. Meares, Rancho Palos Verdes, and Robert D. Simpson, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 29, 1977, Ser. No. 820,372
Int. Cl.[2] H04J 3/02
U.S. Cl. 179—15 A 15 Claims

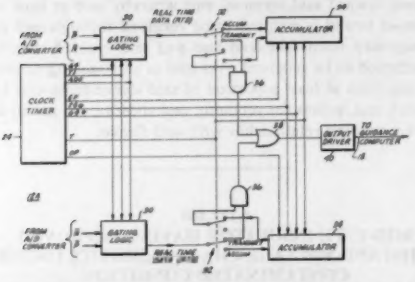
6. An interface system comprising:

gating means for receiving digital signals from a first source and generating a series of real time data pulses in accordance with a selected code;

accumulating means adapted to accumulate a selected plurality of real time data pulses from said first source during a first time interval and transmit pulses corresponding to the accumulated pulses during a second time interval; and

means for selectively interleaving the pulses from the accu-

mulating means with a corresponding plurality of succeeding real time data pulses from said first source for



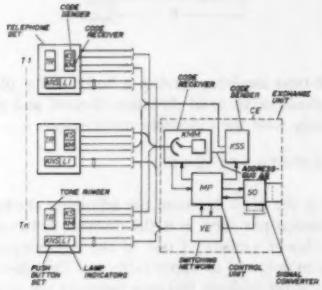
transmission on an output line during the second time interval.

4,174,466

MULTI-PARTY TELEPHONE SYSTEM ALLOWING SPEECH CONNECTION BETWEEN EXTENSIONS AS BETWEEN EXTENSIONS AND AN OUTER LINE

Lars I. Broger, Nynäshamn, and Sten E. Magnusson, Tyresö, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 17, 1977, Ser. No. 825,182
Claims priority, application Sweden, Sep. 1, 1976, 7609646
Int. Cl.[2] H04Q *1/30*
U.S. Cl. 179—18 AD **3 Claims**



1. In a multiparty telephone system having a plurality of telephone sets line pairs for speech signals, an external line for calls outside the multiparty telephone system and a central unit, apparatus for transmitting control indicia between the telephone sets and the central unit as digital signal words, said apparatus comprising:

(1) a line system for conveying digital signal words between the telephone sets and the central unit, said line system including a set of wires connected from each of the telephone sets to the central unit;

(2) a code sender means in each of the telephone sets for transmitting the same digital signal word at least twice via its associated set of wires to the central unit;

(3) a common code receiver means in the central unit for receiving the digital signal words from the telephone sets, said code receiver comprising a scanner means for continuously sequentially scanning the set of wires from each of the telephone sets for a period of time to receive at least two successive digital signal words, comparison means for comparing two successive received digital signal words to give an indication when said two successive received digital words are the same;

(4) a common code sender comprising in the central unit

(a) an addressed digital signal word memory means in the central unit having a plurality of multibit position storage units each associated with a different one of the telephone sets for storing digital signal words associated with the respective telephone sets;

(b) first addressing means responsive to said comparison means for selecting storage units to accept digital signal words;

(c) second addressing means for sequentially selecting the bit positions of all storage units to emit their contents onto the associated sets of wires connecting the central unit to the respective telephone sets; and

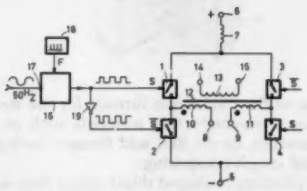
(5) a code receiver in each of the telephone sets for receiving digital signal words on its set of wires connected to the central unit.

4,174,467

RINGING SIGNAL GENERATOR FOR USE IN A SUBSCRIBER'S LINE CIRCUIT

Gilbert M. M. Ferrieu, Bievres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,667
Claims priority, application France, Mar. 8, 1977, 77 06756
Int. Cl.[2] H04M *3/04*
U.S. Cl. 179—18 HB **4 Claims**



1. A ringing signal generator for use in a subscriber's line comprising pulse code signal generator means for providing a pulse code modulated signal corresponding to a sinusoidal ringing signal of a given frequency and having transitions at time intervals that are a multiple of the inverse of a sampling frequency that is substantially higher than said given frequency, switch means responsive to said pulse code modulated signal for reversing a supply current to said subscriber's line during transitions of said pulse code signal, and filter means comprising an inductance in series with said switch means for substantially attenuating those frequencies of the reversed supply current in the subscriber's line that are higher than said ringing signal frequency.

4,174,468

DIGITAL COIN CIRCUIT

David J. Stelte, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

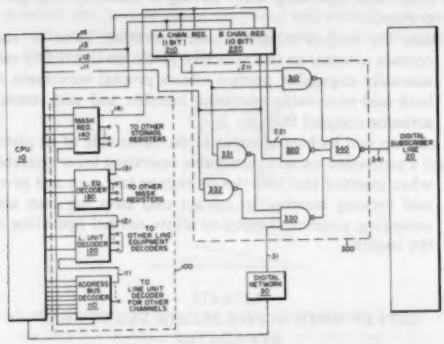
Filed Apr. 3, 1978, Ser. No. 892,526
Int. Cl.[2] H04J *3/12;* H04M *17/02*
U.S. Cl. 179—6.3 R **6 Claims**

1. A digital coin circuit for use in a digital telephone switching system including, at least one multi-channel digital subscriber line connected to at least one coin telephone, a digital network connected to a central processing unit operated to generate, digital data representative of control signals for said coin telephone, a loading signal and a periodic timing signal, said digital coin circuit comprising:

storage means connected to said central processing unit for storage of digital coin telephone control signal bits;

control means connected to said central processing unit, to said storage means and to said digital subscriber line, operated in response to said loading signal to transfer said digital coin telephone control signal bits from said central processing unit to said storage means, and further oper-

ated in response to said periodic timing signal to transfer said bits from said storage means to said digital subscriber



line for asynchronous transmission to said connected coin telephone.

4,174,469

ADJUSTABLE DIRECTIVITY MICROPHONE INCORPORATED IN A TAPE RECORDER CASING

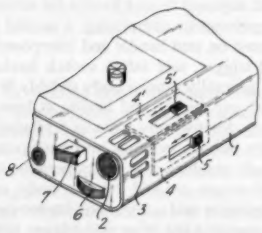
Michio Kusuyama, Hachioji City, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 804,434, Jun. 7, 1977, abandoned. This application Jul. 14, 1978, Ser. No. 924,667

Claims priority, application Japan, Jun. 11, 1976, 51-76135; Jun. 11, 1976, 51-76138

Int. Cl.[2] H04R *1/38*

U.S. Cl. 179—121 D **1 Claim**



1. A microphone device comprising a microphone body, a tape recorder casing for incorporating the microphone therein, said casing having a front wall and a plurality of side walls extending from said front wall, said microphone body being located adjacent said front wall, acoustic inlet holes provided in said front wall and in at least two said side walls adjacent both said front wall and said microphone body, at least two shielding plates mounted on said casing each associated with a different one of said side walls for opening and closing the acoustic inlet holes in said side wall with which said shielding plate is associated, means mounted on said casing accessible from the exterior thereof for moving said shielding plates to open and close the acoustic inlet holes so that the directionality of the microphone can be selectively obtained by the separate actuation of said shielding plates.

4,174,470

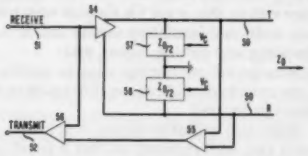
ELECTRONIC HYBRID

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 949,577

Int. Cl.[2] H04B *1/58*

U.S. Cl. 179—170 NC **11 Claims**



1. An electronic hybrid circuit comprising
a transmit port,
a receive port,
a bidirectional access port,
an unbalanced-to-balanced signal conversion circuit connected between said receive port and said access port,
a balanced-to-unbalanced signal conversion circuit connection between said access port and said transmit port,
a differential amplifier having inputs connected to said receive port and the output of said balanced-to-unbalanced signal conversion circuit and an output connected to said transmit port, and
characterized by
a frequency-sensitive, voltage-controlled matching impedance connected between the output of said unbalanced-to-balanced signal conversion circuit and said access port.

4,174,471

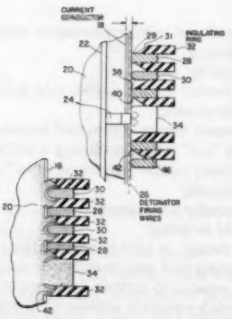
EXPLOSIVELY ACTUATED OPENING SWITCH

Richard D. Ford, Temple Hills, and Ihor M. Vitkovitsky, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1978, Ser. No. 890,873

Int. Cl.[2] H01H *39/00*

U.S. Cl. 200—61.08 **22 Claims**



1. A current-limiting device comprising, in combination:
current-conducting means having an empty central core inside a wall;
inert pusher material filling said central core;
explosive means located within said pusher material;
means for actuating said explosive means; and
at least one module comprising:
insulating means,
cutting means,

bending means,

said latter three means encompassing the current-conducting means, said cutting means having a cutting edge in girdling contact with the wall of said current-conducting means and extending outward from said wall, said bending means having a rounded end in girdling contact with said wall and extending outward from said wall, said insulating means lying between and in contact with said cutting and bending means and encompassing, and extending outward from, said wall and being formed at its inner end so that a void is formed which is bounded by said wall, said insulating means and at least one of said bending and cutting means, and

an explosion-proof containing ring in girdling contact with the outside of said tube in the region in which said detonator is located,

whereby, when said explosive means is actuated, the explosion forces said wall outward so that it is cut completely by said cutting means and a portion of the wall is forced into contact with said bending means leaving a gap in said wall through which the pusher material is forced, said pusher material filling said void to form an insulating layer between the cut portions of said current-conducting means and between nearby portions of said bending and cutting means so that current flow in said current-conducting means is stopped.

4,174,472

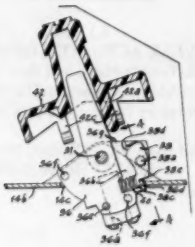
PIVOTED-ACTUATOR SWITCH WITH INTEGRAL OFF-LOCK

Leonardus J. Josemans, Smithfield, N.C., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 26, 1978, Ser. No. 955,109

Int. Cl.[2] H01H *93/20, 21/80, 9/22*

U.S. Cl. 200—68 **8 Claims**



1. A self-enclosed pivoted-actuator switch with integral off-lock comprising:

a switch housing;

stationary contact means within said housing connected to external terminals;

movable contact means within said housing selectively operable to an "on" position closing a circuit with respect to said stationary contact means or to an "off" position opening said circuit;

a switch operator subassembly;

a hole in said housing;

supporting means on said housing adjacent said hole pivotally mounting said switch operator subassembly for reciprocal movement to actuate said movable contact means;

and said switch operator subassembly comprising:

a contact actuator extending from said pivotal supporting means through said hole into said housing for actuating said movable contact means to said "on" or "off" position;

a slot within said contact actuator;

a spring-biased locking member pivotally mounted within said slot in said contact actuator and having a normal unlocking position wherein said member is retracted into said contact actuator and a locking position wherein a stop lug of said locking member at one side of its pivot projects from said contact actuator to abut the top of the rim of said hole in order to lock said contact actuator in its "off" position;

a removable operating lever having a manually engagable portion;

means for snap-in coupling said operating lever to said contact actuator so that selective actuation thereof by said manually engagable portion effects pivotal movement of both said removable operating member and said contact actuator coupled thereto;

a cam on said locking member at the other side of its pivot;

and a projection on said removable operating lever operable when inserted into said slot to engage said cam and pivot said locking member to retract said stop lug into said unlocking position thereby to allow normal operation of the switch.

4,174,473

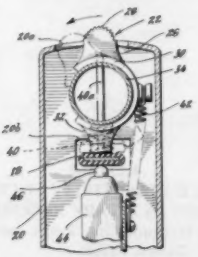
SAFETY SWITCH FOR FLOOR TREATMENT APPARATUS

Allen Brenneman, Elkhart, Ind., assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed May 4, 1978, Ser. No. 902,803

Int. Cl.[2] H01H *9/06, 13/08, 9/20, 3/20*

U.S. Cl. 200—157 **5 Claims**



1. In a motor-driven floor treatment machine having a control box, a cylindrical dual grip handle passing through said control box, a first switch in said control box for controlling said motor, a trigger extending out of opposite sides of said control box and adjacent to said handle for actuating said first switch, the improvement comprising; a second safety switch movably mounted on said handle and interposed between the latter and said trigger, said safety switch having a blocking means that is a generally tubular body slidably fitting over said cylindrical dual grip handle and having at least one lug normally projecting downwardly from said tubular body, spring means normally biasing said lug into engagement with said trigger when said machine is in an inoperative condition, and finger-actuated means on said tubular body and projecting through an opening in said control box for moving said tubular body to disengage said lug from said trigger against the force of said spring means to permit movement of said trigger to actuate said first switch, said blocking means of the safety switch returning to its normal blocking position by said spring means when said finger-actuated means is released.

4,174,474

ENDSWITCH CAM ARRANGEMENT

Hermann Spanier, Windhagen, Fed. Rep. of Germany, assignor to Dr. Boy K.G., Fernthal, Fed. Rep. of Germany

Filed Apr. 28, 1978, Ser. No. 901,146

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2719066

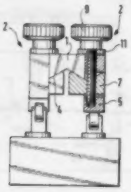
Int. Cl.[2] H01H *3/20*

U.S. Cl. 200—331 **14 Claims**

1. An endswitch cam arrangement having at least one adjustable cam mounted on a switchbar for operation of an end-

switch belonging thereto, wherein said switchbar has a profile forming a plurality of paths for the independent adjustment of the cams mounted thereon,

wherein the cross-sectional profile of said switchbar is essentially rectangular, with a lengthwise, V-shaped groove running along one surface,



wherein each said cam comprises a cam body with a flat surface for mating with one wall of said switchbar, an inclined surface for mating with one wall of said V-shaped groove, and an opposing surface at a right angle to said flat cam body surface for engaging the rectangular wall of said switchbar, and wherein the distance between said inclined cam surface and said opposing surface is adjustable.

4,174,475

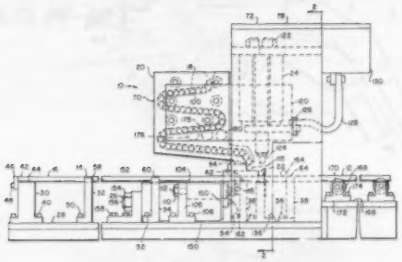
WELDING STRUCTURE

Charles Senn, 12633 Wilfred Ave., Detroit, Mich. 48213

Filed Aug. 30, 1977, Ser. No. 828,983

Int. Cl.[2] B23K *11/10*

U.S. Cl. 219—56 **6 Claims**



1. Structure for welding heavy steel mesh comprising means for supporting longitudinally extending reinforcing rods on one side of welding means in transversely spaced apart parallel positions, means operably associated with the longitudinally extending reinforcing rods for automatically feeding a transversely extending reinforcing rod fed thereto onto the longitudinally extending reinforcing rods at a predetermined welding position from the one side of the welding means comprising a mesh engaging member having a guiding surface extending parallel to the longitudinally extending reinforcing rods and positioned above the longitudinally extending reinforcing rods and positioned above the longitudinally extending reinforcing rods approximately the diameter of the transversely extending reinforcing rods and extending on the one side of the welding means to terminate in an abutment surface adjacent the welding position, a positioning member extending above the guiding surface on the mesh engaging member, and piston and cylinder structure mounting said positioning member for reciprocal movement toward and away from the welding position whereby a transversely extending reinforcing rod positioned on the guiding surface of the mesh engaging member may be moved into the welding position at the welding means adjacent the abutment surface of the mesh engaging member on movement of the positioning member toward the welding position, and a second transversely extending reinforcing rod is allowed to move onto the guiding surface of the mesh engaging member on movement of the positioning member away from the welding position, means for positioning transversely extending reinforcing rods onto the automatic feeding means one at a time, means at the welding position operably associated with the supporting, positioning and feeding means for simultaneously welding a transversely extending reinforcing rod to the longitudinally extending reinforcing rods at the intersections of the longitudinally extending reinforcing rods and the transversely extending reinforcing rod, and means operably associated with the welded transversely extending and longitudinally extending reinforcing rods for automatically indexing the welded reinforcing rods to position the longitudinally extending reinforcing rods for receipt of a subsequent transversely extending reinforcing rod at the welding position in parallel spaced apart relation to the welded transversely extending reinforcing rod, including the mesh engaging member and piston and cylinder means secured thereto for moving the mesh engaging member reciprocally in the direction of extent of the longitudinally extending reinforcing rods a distance equal to the desired spacing between the transversely extending reinforcing rods.

4,174,476

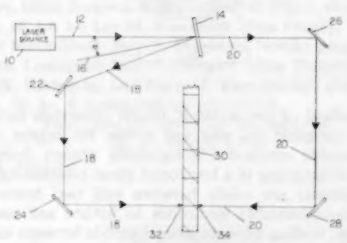
LASER CUTTING OF TUBULAR ARTICLES

Norman L. Boling, and Michael E. Fein, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 11, 1978, Ser. No. 904,729

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 L **8 Claims**



1. Apparatus for severing a rotating tubular article with a laser beam comprising:

a laser source having a single output beam;

a beamsplitter for dividing said output beam into two generally equal components, said beamsplitter being positioned so that said output beam strikes said beamsplitter at an angle of incidence θ with respect to a line normal to the beamsplitter that is greater than 0° and less 15°, thereby maintaining the power of said two components substantially equal despite random polarization of said output beams; and

means for directing said two components to strike the peripheral surface of said tubular article, thereby allowing said tubular article to be completely severed during rotation of said tubular article.

4,174,477

METHOD OF AND DEVICE FOR ARC WELDING

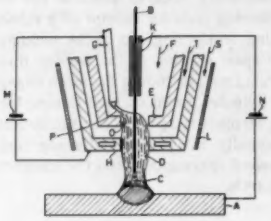
Wilhelmus G. Essers; Gerardus Jelmorini, and Gerrit W. Tichelaar, all of Eindhovea, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

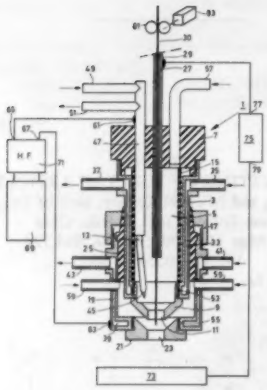
Continuation of Ser. No. 635,988, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 455,393, Mar. 27, 1974, abandoned. This application May 24, 1977, Ser. No. 799,959

Claims priority, application Netherlands, Apr. 9, 1973, 7304888

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **3 Claims**





1. A method of arc welding, which comprises flowing a thermally ionizable gas past and within the region of two non-consumable electrodes horizontally spaced from each other and terminating in a horizontal plane establishing a secondary (plasma) arc solely between said two horizontally spaced non-consumable electrodes to initiate and sustain a plasma flow, feeding a consumable electrode between said two horizontally spaced electrodes and through said plasma flow toward a workpiece, and separately and independently establishing a primary (MIG) arc solely between said consumable electrode and the workpiece.

4,174,478

X-RAY INTERFEROMETERS

Albert Franks, London, England, assignor to National Research Development Corporation, London, England

Filed Jul. 5, 1977, Ser. No. 812,736

Int. Cl.[2] G01N *23/20*; G21K *1/00*

U.S. Cl. 250—276 **6 Claims**

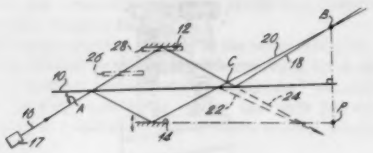
1. An X-ray interferometer comprising:

a plane film of material;

first support-means for supporting a first surface facing one side of the film;

second support-means for supporting a second surface facing the other side of the film and substantially opposite the first surface, so that the first and second surfaces are relatively inclined at a small angle,

arranged so that when a beam of X-rays is incident on the film at a glancing angle in the plane in which said small angle lies, a first part of the incident beam is, in sequence,



transmitted by the film, reflected by the first surface, and reflected by the film as a first partial beam, and a second part of the incident beam is, in sequence, reflected by the film, reflected by the second surface, and transmitted by the film as a second partial beam which intersects the first partial beam.

4,174,479

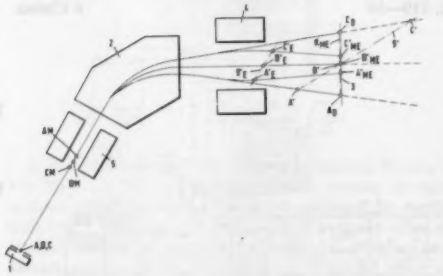
MASS SPECTROMETER

Hans H. Tuithof, Korenbloem 52, Uithoorn, and Anne J. H. Boerboom, Abr. Durerstraat 25, II, Amsterdam, both of Netherlands

Filed Sep. 30, 1977, Ser. No. 838,175

Int. Cl.[2] B01D *59/44*; H01J *39/34*

U.S. Cl. 250—292 **7 Claims**



1. A mass spectrometer capable of providing mass spectra measurements of short-lived phenomena comprising an ion source for producing a beam of ions of differing masses, a sector magnet, a planar detector, a variable power magnetic lens disposed between said ion source and said sector magnet for determining the dispersion of ions on said beam, and a variable power electrostatic lens disposed between said sector magnet and said detector, said electrostatic lens rotating the image curve of said ion beam to be parallel to and aligned with the plane of the detector wherein the image points corresponding to particles of different masses are simultaneously aligned with said plane of said detector.

4,174,480

METHOD OF DETECTING DEFECTIVE PORTIONS OF METALLIC TANK HAVING THERMALLY PROTECTIVE COATING OF POLYURETHANE FOAM

Takashi Kaihara; Masao Taneoka, and Toshitsugu Kusaka, all of Muroran, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 8, 1977, Ser. No. 858,902

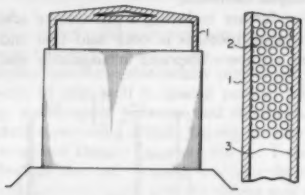
Claims priority, application Japan, Dec. 9, 1976, 51/147149

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—342 **6 Claims**

1. A method of detecting defective portions of a metallic

tank storing hot hydrocarbon oil therein and having a thermally protective coating of polyurethane foam adhered onto the side wall thereof, comprising the steps of determining a distribution of surface temperatures of said coating of polyurethane foam by taking an infrared thermal image of the outer



surface of said coating of polyurethane foam, and analyzing said infrared thermal image to determine portions of said coating having relatively high temperatures, whereby corroded areas in the side wall of the tank and defective portions of said coating of polyurethane foam which cause corrosion of the side wall of the tank are detected.

4,174,481

TOMOGRAPHIC X-RAY APPARATUS FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

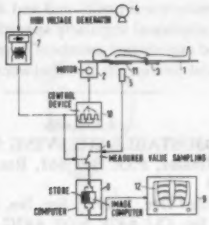
Reiner Liebetruth, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,452

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613809

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **3 Claims**



1. The method of aligning a patient with respect to tomographic X-ray apparatus which includes an X-ray tomographic scanner apparatus for scanning a transverse region from successive angular positions about said region for defining a tomographic image, said method comprising:

(a) restricting the scanner apparatus to a single angular position,

(b) moving a patient longitudinally relative to the scanner apparatus while the scanner apparatus remains in said single angular position such that the patient is scanned at successive longitudinal positions offset from each other longitudinally of the patient but is only scanned from the single angular position,

(c) storing respective sets of readings from the scanner apparatus for the successive longitudinal positions with the scanner apparatus in said single angular position thereby to provide the data for a graphic display wherein the sets of readings are the basis for successive lines of varying visual characteristics on the display, the stored sets of readings thereby defining a general radiographic view representing a longitudinally extensive image useful in the precise positioning of the patient relative to the tomographic X-ray apparatus, and

(d) displaying the stored sets of readings as successive lines of a longitudinally extensive shadow image of the patient.

4,174,482

FOUNDATION FRAME FOR AN INTERNAL COMBUSTION ENGINE AND ELECTRICAL GENERATOR SET

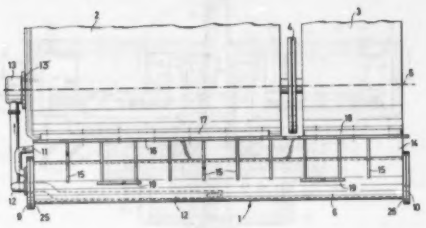
Edwin Bollman, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 4, 1977, Ser. No. 848,643

Claims priority, application Switzerland, Nov. 16, 1976, 14380/76

Int. Cl.[2] F16M *5/00, 9/00*

U.S. Cl. 290—1 A **12 Claims**



9. In combination with a set having an internal combustion engine having a base and an electrical generator having a base; a foundation frame for mounting said set, said foundation frame comprising a pair of parallel rigidly interconnected tubes of round cross-section, each said tube defining a reservoir for receiving a liquid lubricant therein, and a pair of plates, each said plate being secured to and extending longitudinally of a respective one of said tubes and receiving said base of said engine and said base of said generator thereon.

4,174,483

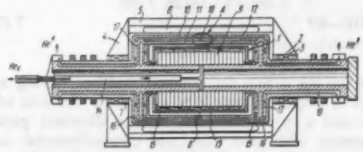
CRYOGENICALLY COOLED ELECTRICAL MACHINE

Alexandr A. Vinokurov, ulitsa Polzunova, 31, kv. 314; Gennady S. Gorbunov, ulitsa Polzunova, 35, kv. 32; Anatoly G. Korolkov, ulitsa Ivanova, 5, kv. 71; Jury S. Popov, ulitsa Barnaulskaya, 16, kv. 14; Lev M. Rozenfeld, ulitsa Pravdy, 7a, kv. 30, all of Novosibirsk; Jury V. Skachkov, Nevsky prospekt, 125, kv. 13, Leningrad; Iosif F. Filippov, ulitsa Pulkovskogo, 17, kv. 39, Leningrad, and Gary M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5, Leningrad, all of U.S.S.R.

Filed Nov. 29, 1977, Ser. No. 855,778

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—52 **7 Claims**



1. A cryogenically cooled electrical machine comprising:

a hermetically-sealed shell;

a stator winding fixed in place within said shell;

a hollow rotor arranged inside said stator winding;

a superconducting field winding placed within said hollow rotor;

a heat shield surrounding said hollow rotor and having ducts for circulation of a coolant;

a magnetic shield arranged inside said heat shield and

said magnetic shield and said heat shield being arranged

within an evacuated space between said rotor and said shell.

4,174,484

MOTOR WITH A DISK ROTOR

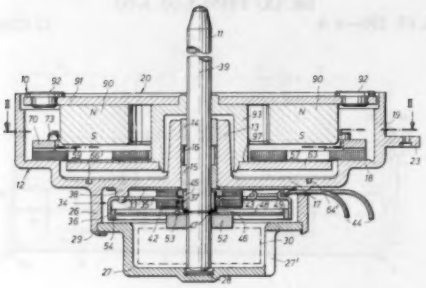
Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed Jul. 23, 1976, Ser. No. 708,092

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533187

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 R **39 Claims**



1. Brushless d.c. motor having a substantially disk-shaped permanent magnet rotor mounted on a shaft, a flat air gap and an iron-free stator winding arrangement comprising coils affixed to the motor casing at their radially outer portions so that said coils extend self-supporting into said air gap, said rotor comprising spacing means **(93)** located radially inward of said stator winding arrangement and between rotor portions extending respectively on both sides of said stator winding arrangement for withstanding magnetically produced axial forces between said rotor portions, said motor casing **(12)** being substantially shell-shaped and arranged to surround at least part of said rotor, said spacing means **(93)** surrounding with an interposed clearance a tubular bearing means **(13)** firmly attached to said motor casing **(12)** for journalling the shaft **(11)** of said rotor, said spacing means **(93)** being mounted so as to rotate with said shaft **(11)**.

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ELECTRIC MOTOR WITH NOVEL STATOR CONSTRUCTION

George B. Soden, Wolcott; Hasit H. Parikh, Southington, and Richard J. Kavanaugh, Bristol, all of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,495

Int. Cl.[2] H02K *5/00*

U.S. Cl. 310—89 **7 Claims**

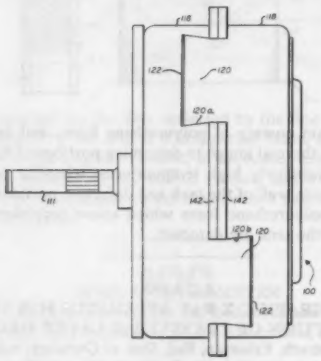
1. An electric motor having:

a rotor having an axis;

a stator having a first cup shaped member having a wall which is disposed generally normal to the axis of said rotor and a circumferential surface disposed generally concentric with said axis, said circumferential surface including a plurality of tabs and a plurality of cooperatively dimensioned and configured recesses, said first cup shaped member further including a plurality of pole pieces disposed in generally aligned relationship to said axis and disposed at angularly spaced intervals about said axis;

a second cut shaped member having a wall which is disposed generally normal to the axis of said motor and a circumferential surface disposed generally concentric with said axis, said circumferential surface including a plurality of tabs and a plurality of cooperatively dimensioned and configured recesses, said second cup shaped member further including a plurality of pole pieces disposed in generally aligned relationship to said axis and disposed at angularly spaced intervals about said axis, said tabs of said second cup member and said recesses of said first shaped cup shaped member locking together by means of interference between said tabs and said recesses to form a unitary assembly without additional fastening means between said cup shaped members;

said stator further including a plurality of additional angularly spaced recesses in both said first and second cup shaped members disposed at angularly spaced intervals



about said circumferential surface along the edge which contacts the other cup shaped member;

first and second inner pole plates which are generally planar and have a plurality of upstanding pole pieces disposed in generally parallel relationship to the axis of said rotor, said pole plates further including a plurality of angularly spaced tabs disposed within the plane of said generally planar members and positioned and dimensioned for snug fit in said additional angularly spaced recesses of said first and second cup shaped members to prevent relative angular and axial movement therebetween.

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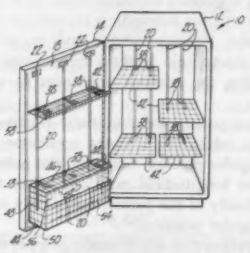
ADJUSTABLE SHELVING SYSTEM

Clifford W. Winkler, P.O. Box 561, Rte. 2, Houghton Lake, Mich. 48629

Filed Dec. 2, 1977, Ser. No. 856,666

Int. Cl.[2] A47F *5/00;* **A47G** *29/02*

U.S. Cl. 312—138 R **3 Claims**



1. An adjustable shelving support system for appliances and the like comprising:

at least a pair of parallel spaced standards, each having a thin-walled rigid body exhibiting a continuous slot opening in one side thereof;

at least one rigid shelf support arm operatively engaged with each of said pair of standards through said opening, each said support arm including selectively operatable lock

means within the associated standard whereby each arm may be fixed in relation to the associated standard when at right angles thereto but released for sliding relationship when rotated away from the right angular relationship;

each shelf support arm having a T-shaped cross section in which the top thereof is adapted to receive and support thereon a flat structural element such as a standard wood shelf;

a shelf constructed of rigid wire elements and of such width as to extend between said standards;

a pair of adaptor brackets substantially permanently fixed to the elements of said shelf in spaced parallel relationship according to the space between said standards, each of said brackets comprising a body having an interior space opening to an end thereof for receiving the T-shaped arm therein through said end opening whereby the shelf may be positively secured to the arms by sliding said arms into said brackets to form a unit consisting of the arms, brackets and shelf, said unit being positionally adjustable relative to the standard as aforesaid and said shelf being removable from said arms by sliding said arms out of said interior spaces;

each bracket being at least substantially wholly within the boundaries of said shelf when secured thereto in operative relationship but with the end opening and the interior space located adjacent but out of the plane of said shelf so as to permit said arm to enter said opening for operative engagement therewith.

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MIRROR CONDENSER LAMP

Jozef C. I. Peeters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1977, Ser. No. 775,455

Claims priority, application Netherlands, Mar. 10, 1976, 7602483

Int. Cl.[2] H01J *61/40*

U.S. Cl. 313—113 **2 Claims**

1. A mirror condenser lamp comprising:

a glass lamp vessel having a rotationally symmetrically dished mirrored wall portion having a focus and a rotationally symmetrically dished transparent wall portion, said portions being disposed in facing and abutting relationship with the intersection therebetween being a curvilinear line of intersection, a cylindrical wall portion extending from said line of intersection of said two dished portions,

a tungsten filament and current supply wires connected to said filament, said filament being disposed in said lamp vessel surrounding the focus of said mirrored wall portion and within said lamp vessel, said current supply wires extending through said line of intersection, in substantially a transverse direction to light rays being reflected from said dished mirrored wall portion,

a vacuum-tight seal in said cylindrical portion of said lamp vessel through which said current supply conductors are passed to the exterior of said vessel, and

an inert gas-containing atmosphere in said lamp vessel, said gas atmosphere has a pressure of more than 1 atmosphere and containing a halogen, said lamp vessel consisting of a halogen-resistent hard glass having a softening temperature of at least 500° C., said vessel being dimensioned so the inside of the wall of the lamp vessel during operation assumes a temperature at which tungsten-halogen compounds are volatile.

4,174,488

ELECTRIC LAMP

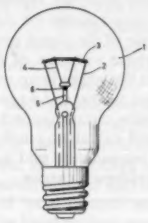
Petrus J. J. Weterings, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,734

Claims priority, application Netherlands, Sep. 22, 1976, 7610507

Int. Cl.[2] H01K *1/00*

U.S. Cl. 313—315 **1 Claim**



1. An electric lamp which comprises: a light-pervious lamp envelope, a mixture of an oxygen getter and a binder disposed in said envelope, said binder being a halide of a metal selected from the group consisting of Mn, Ba, Ca, Sr, Ce and La.

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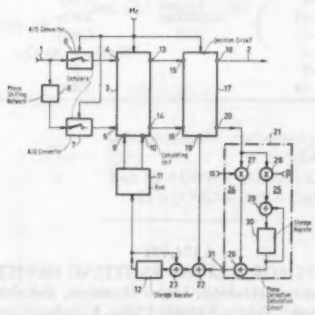
PHASE DISCRIMINATOR IN A RECEIVER FOR A DATA TRANSMISSION SYSTEM

Loïc B. Y. Guidoux, and Jean-Louis Renaudat, both of Le Plessis Robinson, France, assignors to Telecommunications Radioelectriques et Telephoniques TRT, Paris, France

Continuation of Ser. No. 753,270, Dec. 22, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,193

Int. Cl.[2] H03K *9/06*

U.S. Cl. 325—320 **11 Claims**



1. A phase discriminator for use in a receiver of a system for data transmission by means of phase modulation of a carrier, the phase discriminator comprising a pair of samplers each having input means for receiving digital passband signals and an output means for providing digital signals having samples which occur at a rate equal to the data modulation rate, said sampled digital signals being respectively representative of the in-phase and quadrature components of said received passband signal at each sampling instant; a calculating unit having a first pair of inputs coupled to said output means respectively, a second pair of input means for receiving respectively the in-

phase and quadrature components of a reference carrier at the preceding sampling instant, and output means for providing the signal samples of digital signals which are representative of the in-phase and quadrature of a reference carrier at the preceding sampling instant, and output means for providing the signal samples of digital signals which are representative of the in-phase and quadrature components of a signal derived from the received passband signal by a phase rotation over an angle which is equal and opposite to the phase of the reference carrier at the preceding samping instant; a decision circuit having input means coupled to said calculating unit output means, a first output means for providing a signal reproducing a phase jump in accordance with each sampling instant the phase variation of the transmitted carrier during one sampling period, and a second output means for providing an error signal which is formed after the reproduction of each phase jump in the decision circuit means for characterizing the difference between the phase of the signal determined by the calculating unit and the phase variation of the transmitted carrier which corresponds to the phase jump reproduced by the decision circuit first output means; and a generator having an input coupled to said decision circuit second output and an output means coupled to said calculating unit second pair of input means for providing respectively said in phase and quadrature components of said reference carrier.

4,174,490

CATHODE-RAY TUBE

Klaus C. Van Erk; Marinus Ploeger, and Peter H. Von Reth, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1978, Ser. No. 907,553

Claims priority, application Netherlands, May 25, 1977, 7705731

Int. Cl.[2] **H01J** *31/20;* **C03C** *3/10, 3/30*

U.S. Cl. 313—480 **2 Claims**

1. In a colour television cathode ray tube included an evacuated glass envelope having a glass face plate, a fluorescent layer having a pattern of phosphor regions on the inner surface thereof, and at least one electron gun disposed in said envelope opposite said face plate, the improvement wherein said glass of said face plate consists essentially of, in percent by weight:

SiO_2	60-68		SrO	0-1
Al_2O_3	0-6		PbO	5-10
Na_2O	5-12	combined	ZrO_2	0-3
K_2O	3-11	>13	CeO_2	0-0.6
CaO	0-1		$Sb_2O_3 + As_2O_3$	0.3-0.7
MgO	0-2		F	0-1.5
BaO	3-14		TiO_2	0-0.3

with the complementary conditions that

$Al_2O_3+ZrO_2>2$

$BaO+2SrO+2ZrO_2+3PbO>28$ and

$3CaO+2MgO+SrO+4ZrO_2<12$

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MOUNT FOR A LIGHT EMITTING DEVICE

Satoshi Nakamura, Hachioji; Ichiro Ikushima, Kokubunji; Yoshimitsu Sasaki, Tokyo; Katuaki Chiba, Kokubunji, and Ryoichi Ito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 22, 1978, Ser. No. 918,275

Claims priority, application Japan, Jul. 8, 1977, 52-80961

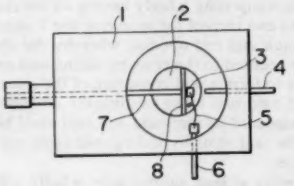
Int. Cl.[2] **H01L** *33/00;* **H05B** *33/04;* **H01S** *3/00*

U.S. Cl. 313—499 **15 Claims**

1. A mount for a light emitting device including a light emitting element and optical parts, which comprises

mount substrate means provided, with one surface having a positioning groove for locating the light emitting element at a predetermined position and holding grooves of trapezoidal cross section for holding the optical parts in the vicinity of a light emitting plane of the light emitting element;

keeper substrate means provided with one surface having keeping-down grooves of trapezoidal cross section formed in positions corresponding to the respective holding grooves of said mount substrate means, to serve to install the optical parts in cooperation with said holding grooves of said mount substrate means, and with a hole penetratingly extending from the one surface thereof to another surface opposite to the one surface, for snugly



inserting therein the light emitting element to be located by said positioning groove of said mount substrate means; and

a covering member provided on the other surface of said keeper substrate means, for airtightly covering said hole of said keeper substrate means;

so that said optical parts are sandwiched in between said mount substrate means and said keeper substrate means and integrally held in close contact therewith, and that they can be airtightly sealed together with the light emitting element.

4,174,492

DEVICE FOR ATTENUATING CAVITY INTERFERENCE WAVES IN A HIGH-FREQUENCY ELECTRON TUBE

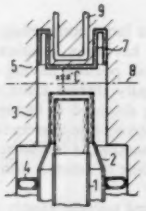
Johannes Holle, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,350

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632404

Int. Cl.[2] **H01J** *7/46, 19/80*

U.S. Cl. 315—39 **7 Claims**



1. In a device for attenuating electromagnetic cavity interference waves, which occur in the vacuum system of a high frequency electron tube having an internal coaxial cavity resonator formed, in part, by the tube anode, the combination of a wave-guide resonator portion, a dielectric window disposed between and coupling the wave-guide portion to the cavity resonator and separating the wave-guide portion from the vacuum system of the tube, said wave-guide portion having a high ohmic resistive coating therein, which thus is external of the vacuum system, said wave-guide portion and resistive material, in effect, presenting a low resistance to interference modes to be attenuated, for the suppression thereof.

4,174,493

VERTICAL DEFLECTION CIRCUIT

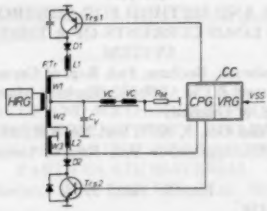
Gerd Dobbert, Deizisau, and Klaus Reh, Albershausen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 888,047

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2712052

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—408 7 Claims



1. In a vertical deflection circuit, of the type wherein the deflection current for the vertical deflection coils is obtained by integrating pulses derived from the horizontal deflection voltage, a horizontal output transformer including a pair of output windings each connected to an integrating capacitor and the vertical deflection coils at one end and the other ends being selectively connected to ground through two switches associated with the upper and lower picture halves, the improvement comprising control means for turning on said switches only during the horizontal sweep time in the rhythm of the horizontal frequency with only one of the other ends of the two output windings being grounded at one time.

4,174,494

ELECTRIC MOTORS CONTROL SYSTEM

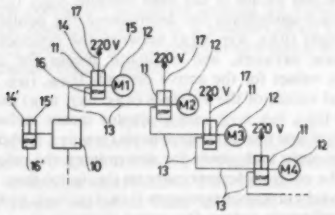
Paul Pfeffer, Gomaringen, Fed. Rep. of Germany, assignor to Etablissements Carpano & Pons, France

Filed Nov. 14, 1977, Ser. No. 851,185

Claims priority, application Switzerland, Nov. 22, 1976, 14640/76

Int. Cl.[2] H02P *1/00*

U.S. Cl. 318—54 5 Claims



1. A system for controlling a plurality of reversible electric motors for driving blinds or similar devices, said system comprising:

a plurality of reversible electric motors each connected with and driving a blind or similar device and each having a plurality of terminals comprising a first terminal for rotation of the motor in a first direction, a second terminal for rotation of the motor in a second direction and a common terminal,

central control means comprising a first central inverter actuatable for rotation of all of said motors in a first direction, a second central inverter actuatable for rotation of all of said motors in a second direction, and a central stop switch actuatable for stopping all of said motors,

a common power line for supplying power to all of said motors, and

a plurality of local control means, one for each of said motors, each of said local control means comprising:

a first local inverter actuatable for rotation of the respective motor in a first direction, a second local inverter actuatable for rotation of said motor in a second direction, and a local stop switch for stopping said motor,

a first relay having an operating coil and operable to connect said first terminal and said common terminal of the respective motor with said power line for rotation of said motor in said first direction, and a second relay having an operating coil and operable to connect said second terminal and said common terminal with said power line for rotation of said motor in said second direction,

means connecting the operating coil of said first relay with said first local inverter of the respective local control means and with said first central inverter, and means for connecting the operating coil of said second relay with said second local inverter and with said second central inverter, whereby said first and second relays are actuatable alternatively from said central control means and said local control means, the connections of said operating coils of said first and second relays with said central inverters including unidirectional current means to prevent feed-back from said local control means to said central control means or the local control means of other motors, and

means connecting the respective local stop switch and said central stop switch with both said first and second relays for stopping the respective motor upon actuation of either said local stop switch or said central stop switch, whereby all of said motors can be operated in either direction and stopped from the said central control means and each of the individual motors can be operated in either direction or stopped from the respective local control means without feed-back to the central control means or to other motors.

4,174,495

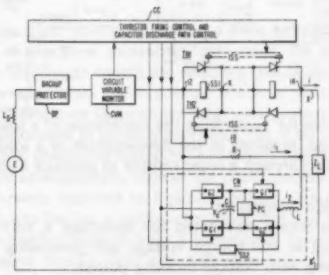
STATIC CURRENT LIMITING SWITCH WITH SOFT FORCED COMMUTATION

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1978, Ser. No. 921,020

Int. Cl.[2] H02H *7/00*

U.S. Cl. 323—9 17 Claims



1. A current limiting switch, comprising:

(a) a pair of terminal means connectable to an electrical circuit in which alternating current flows;

(b) first gated means connected between said pair of terminal means for passing said alternating current therethrough in one circuit direction;

(c) second gated means connected between said pair of terminal means for passing said alternating current therethrough in the other circuit direction;

(d) current limiting means connected between said pair of

terminal means for passing said alternating current therethrough in both said circuit directions for thus performing a current limiting operation on said alternating current during an appropriate period of time;

(e) normally off switchable stored energy means connected between said pair of terminal means; and

(f) control means connected to said stored energy means and to said first gated means for switching said switchable stored energy means on and for rendering said first gated means conductive during a portion of said appropriate period of time for thus providing electrical current to said first gated means from said energy storage means when said second gated means has been rendered non-conductive during said portion of said appropriate period of time, said current from said stored energy means when flowing through said first gated means cooperating with the intrinsic impedance thereof to provide a forward voltage drop across said first gated means which provides soft reverse bias voltage for said second gated means, the presence of said soft reverse bias voltage continuing for the recovery time of said second gated means to prevent reconduction of said circuit alternating current through said second gated means, said current limiting means performing said current limiting operation at this time.

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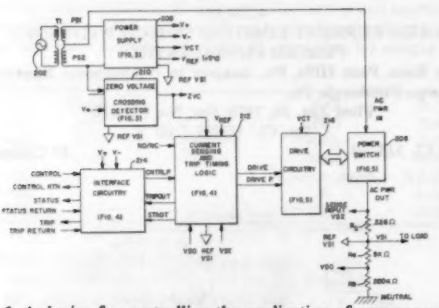
MONOLITHIC SOLID STATE POWER CONTROLLER

William A. McFall, Fullerton; Stanley A. White, Santa Ana; Howard K. Lane, Laguna Niguel; Daryl T. Butcher, La Habra; Donald V. Anderson, Jr., Riverside; Patrick E. McCollum, Santa Ana; James F. Kirk, Anaheim, and Richard Plesset, Santa Ana, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 2, 1978, Ser. No. 930,460

Int. Cl.[2] H02H *3/26*

U.S. Cl. 323—9 **34 Claims**



1. A device for controlling the application of a source voltage to a load, resulting in the development of a load current which passes through a sense resistor to produce a sense voltage,

said device comprising:

detection means connected for detecting a zero voltage crossing in said source voltage and generating a corresponding zero voltage crossing output;

sensing means for receiving said sense voltage and responsive thereto for determining when said load current exceeds a first predetermined value, and generating a fast trip output corresponding thereto, said sensing means further deriving a digital output representing the magnitude of said load current;

computing means for comparing said digital output of said sensing means to a second predetermined value, less than said first predetermined value, for computing a trip time characteristic of said load current in accordance with the value and duration of said comparison, and for determining when said trip time is exceeded so as to generate a timed trip output; and

control means responsive to either of said fast trip output and said timed trip output for interrupting the application of said source voltage to said load, said control means being further responsive to said output of said detection means for preselected control mode synchronization therewith.

4,174,497

CIRCUIT AND METHOD FOR CONTROLLING REACTIVE LOAD CURRENTS OF A THREE-PHASE SYSTEM

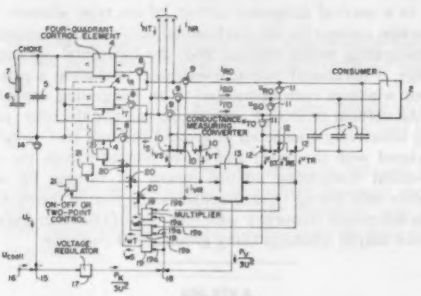
Manfred Depenbrock, Bochum, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 839,038

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644682

Int. Cl.[2] H02J *3/18*

U.S. Cl. 323—119 **12 Claims**



1. Circuit assembly for compensating and balancing rapidly variable reactive currents of loads connected to a three-phase network, the circuit assembly having compensation control element in the form of three converters with forced commutation connected in parallel with the loads of the three-phase network, at least one energy accumulator connected to the d-c side of the converter, and a closed control loop having measuring transformers for the actual values of the currents (i_R, i_S, i_T) of the compensation control elements, measuring transformers for the actual values of the load currents (i_{RO}, i_{SO}, i_{TO}) and measuring transformers for determining the actual values of the voltages (u_{RS}, u_{ST}, u_{TR}) between the conductors of the three-phase network, and evaluator means for calculating reference values for the active currents (i_{WR}, i_{WS}, i_{WT}) from the actual values of the voltages (u_{RS}, u_{ST}, u_{TR}) and the load currents (i_{RO}, i_{SO}, i_{TO}), said evaluator means including three summers of first current components (i_{VR}, i_{VS}, i_{VT}) determined instantaneously and means for determining the reference values for the control element currents (i_R, i_S, i_T) from the difference of said current components (i_{VR}, i_{VS}, i_{VT}), and for determining reference values for active currents (i_{WR}, i_{WS}, i_{WT}) from the difference of the reference values and the actual values of the control element currents (i_R, i_S, i_T) which control deviations (x_R, x_S, x_T) for controlling firing pulse formers for the compensation control elements to adjust the waveform of the currents on the three-phase side, comprising

(a) said evaluator means being in the form of a conductance measuring converter having an output connected to a fourth summer and an active-current reference value generator connected to said fourth summer for determining, continuously in time, the reference values for the active currents (i_{WR}, i_{WS}, i_{WT}), said conductance measuring transformer being acted upon on the input side thereof by the first current components (i_{VR}, i_{VS}, i_{VT}) and the linked load voltages (u_{RS}, u_{ST}, u_{TR}), the active-current reference value generator being additionally acted upon

by the linked load voltages (u_{RS}, u_{ST}, u_{TR}) and by the output signal of the conductance measuring transformer,

(b) capacitors shunted across the loads in all three phases,

(c) said energy accumulator being in the form of an additional capacitor and a resonant circuit, said resonant circuit being tuned to twice the network frequency,

(d) said control loop comprising means for regulating the mean voltage (U_c) on the d-c side of the compensation control element as well as said evaluator means for controlling the wave-shape of the currents on the three-phase side,

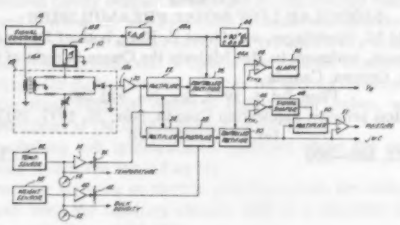
(e) said regulating means having an output connected to said fourth summer.

4,174,498

APPARATUS AND METHOD FOR PROVIDING SEPARATE CONDUCTIVITY, DIELECTRIC COEFFICIENT, AND MOISTURE MEASUREMENTS OF PARTICULATE MATERIAL

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008

Filed Mar. 30, 1978, Ser. No. 891,535
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 R **22 Claims**



1. An apparatus for providing a moisture content signal whose value is related to the measured moisture content of particulate material, said apparatus comprising:

(a) first means for providing a conductivity signal whose value is related to the measured conductivity of said particulate material;

(b) second means for providing a dielectric coefficient signal whose value is related to the measured dielectric coefficient of said particulate material; and

(c) third means responsive to said conductivity and said dielectric coefficient signals for varying the value of said dielectric coefficient signal in a predetermined relationship with the value of said conductivity signal to obtain said moisture content signal.

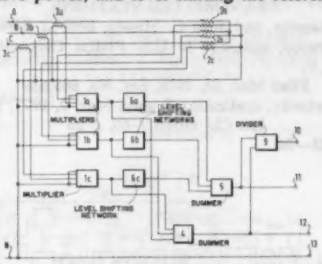
4,174,499

METHOD AND APPARATUS FOR THE MEASUREMENT OF ALTERNATING-CURRENT POWER IN TRANSIENT AND SUBTRANSIENT PROCESSES

Bruno G. Waurick, 14, Sylvia Pass, Linksfield, Johannesburg, South Africa

Filed Sep. 26, 1977, Ser. No. 836,795
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1976, 2643457; Oct. 15, 1976, 2646630
Int. Cl.² G01R *21/06, 25/00*
U.S. Cl. 324—107 **8 Claims**

1. A method for measurement of a.c. power relative to a source and a load, in particular for transient and subtransient events, comprising the steps of: deriving first input signals which are proportional to instantaneous values of a voltage, deriving second input signals which are proportional to instantaneous values of a current, multiplying said first and second input signals with each other, obtaining product signals of positive and negative polarity which are proportional to the product of the current and voltage instantaneous values and thus to the forward power flowing from said source to said load and return power flowing back to said source, summing said product signals by adding the product signals taking into consideration the positive and negative signs and determining the effective power, and level shifting the reference line on



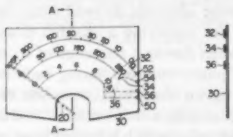
which the measurement is based to the level of the lower peaks of the envelope curve of the product signals which are proportional to the return power and determining the apparent power by adding the level shifted product signals which are proportional to the forward power and return power.

4,174,500

SCALE PLATE FOR MEASURING INSTRUMENTS

Yasuo Kuga, Mitaka, Japan, assignor to Kabushiki Kaisha Sanwa Denki Seisakusho, Tokyo, Japan

Continuation of Ser. No. 663,681, Mar. 4, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,541
Claims priority, application Japan, Mar. 15, 1975, 50-34149
Int. Cl.² G01R *15/08*; G02F *1/13*
U.S. Cl. 324—115 **10 Claims**

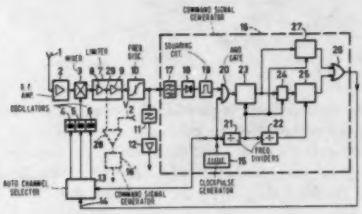


1. A scale plate having a plurality of scale arrangements for use with an electrical measuring instrument, the instrument having a changeover switch for selecting one of the plurality of scale arrangements and a pointer which is pivotably supported to indicate on the selected scale arrangement the electrical measurement in an analog manner, the scale plate comprising plural displaying means for selectively displaying each of the scale arrangements, each of the plural displaying means being separately disposed on a plate member, each of the displaying means having a voltage excitable material contained within a chamber formed from a transparent front electrode means spaced from a rear electrode disposed on the plate member and a continuous insulating side wall joining the transparent front electrode means and the rear electrode, the front electrode means including the scale arrangement, the scale arrangement being an arcuate scale having alphanumerics and/or numerics and/or characters designating values assigned to scale marks, whereby one of the plurality of scale arrangements can be selectively rendered visible to the exclusion of the remaining scale arrangements by applying a voltage between the front electrode means and the rear electrode of one of said plural displaying means selected in accordance with the position of the changeover switch.

4,174,501
COMMAND SIGNAL GENERATOR FOR AN AUTOMATIC CHANNEL SELECTION DEVICE IN A RADIO WHICH IS MOBILE RELATIVE TO TRANSMITTER STATIONS

Jean Chastagnier, and Jean C. Massip, both of Brive la Gaillarde, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,610
Claims priority, application France, Mar. 9, 1977, 77 06964
Int. Cl.[2] H04B *3/60, 1/26*
U.S. Cl. 325—56 **5 Claims**



1. A command signal generator for a channel selection device in a radio receiver for frequency or phase modulation which is mobile relative to fixed transmitter stations transmitting at mutually different frequencies, wherein the generator comprises:

means for forming a logic signal indicating whether the level of the received signal is above or below a first given threshold,

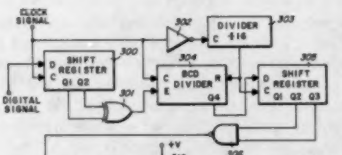
a gate which passes the pulses of a clock pulse generator if said logic signal attains the value which indicates that the level of the received signal is below said threshold,

means for counting the clock pulses passed by said gate during given time intervals derived from the clock pulse generator and for supplying a channel change command signal either when during a sequence of n time intervals τ the number of pulses counted during each time interval τ attains a first given threshold, or when the number of pulses counted during a time interval τ attains a second given threshold value which is higher than said first given threshold value.

4,174,502
DELTA MODULATED DIGITAL SIGNAL DETECTOR

Alan L. Wilson, Schaumburg, and Charles A. Backof, Jr., Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 16, 1978, Ser. No. 951,895
Int. Cl.[2] H03K *9/00*
U.S. Cl. 329—104 **16 Claims**



1. A detector for delta modulated digital signals transmitted in a serial bit stream at a predetermined bit frequency of a clock signal, comprising:

means for generating a clock signal;

first counting means responsive to the clock signal for providing a reset pulse signal at the end of each successive N bit interval, where N is an integer;

transition detection means responsive to the digital signal and the clock signal for providing a transition pulse signal for each change in logical state between successive bits of the digital signal;

second counting means responsive to the transition pulse signals and reset pulse signals for repetitively providing totallized counts of the transition pulses occurring between successive reset pulse signals;

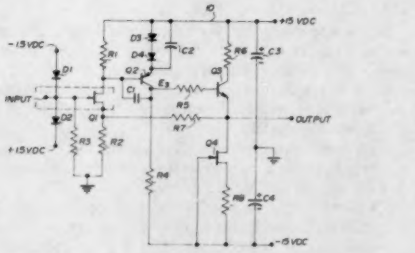
means for storing at least the last two successive totallized counts; and

means for providing a detect indication signal that the ditital signal is present when both of the stored totallized counts have a magnitude outside of a predetermined range of magnitudes centered about one-half of N.

4,174,503
MODULAR LOW NOISE PREAMPLIFIER

Harold M. Merklinger, and Orest Z. Bluy, both of Dartmouth, Canada, assignors to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Jul. 6, 1978, Ser. No. 922,360
Claims priority, application Canada, Nov. 25, 1977, 291786
Int. Cl.[2] H03F *3/16*
U.S. Cl. 330—300 **4 Claims**

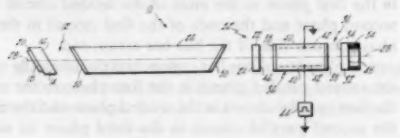


1. An amplifier comprising an input stage, a second stage and a third stage, said input stage comprising a field effect transistor (FET) connected in a common source configuration and having a gate electrode to which is connected an input terminal, said input terminal being connected to a pair of oppositely poled reverse-biased input protection diodes, said field effect transistor (FET) acting as a voltage-to-current converter and feeding said second stage, said second stage comprising a PNP junction transistor connected in a common emitter configuration and acting as a current-to-voltage converter, said third stage comprising a further junction transistor connected as an emitter follower, a feedback connection from the third stage to the first stage, for controlling the overall gain of the amplifier, said second and third stages being powered by a bipolar power supply with said second stage junction transistor having an emitter connected to positive supply voltage, said third stage including a second field effect transistor (FET) connected in series with said further junction transistor to enhance output dirve capability, said further junction transistor having a base and a collector with resistors connected in series with them to provide output short circuit protection.

4,174,504
APPARATUS AND METHOD FOR CAVITY DUMPING A Q-SWITCHED LASER

Peter P. Chenausky, Avon; Carl J. Buczek, Manchester, and Robert J. Wayne, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 25, 1978, Ser. No. 872,282
Int. Cl.² H01S 3/11
U.S. Cl. 331—94.5 Q 27 Claims

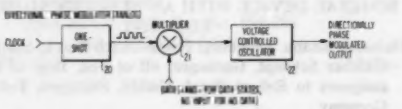


1. A laser having an optical axis and adapted for providing submicrosecond pulses of infrared radiation comprises:
- a first cavity including a gaseous gain medium capable of continuous wave operation defined at one end by a first reflector and at the other end by a second reflector;
- a second cavity defined at one end by the second reflector and at the other end by a third reflector wherein the first cavity and the second cavity are symmetrically disposed about the optical axis in optical line of sight communication with each other and wherein the second reflector and the third reflector define a Fabry-Perot etalon, which functions as the output mirror of the laser;
- a switching cell symmetrically disposed about the optical axis within the second cavity;
- means for applying an electric potential across the switching cell with the resulting electric field in a direction transverse to the optical axis;
- means for tuning the first cavity to obtain maximum optical flux of a specific wavelength of radiation oscillating within the first cavity; and
- means for varying the separation between the second reflector and the third reflector to tune the second cavity to the wavelength of radiation capable of oscillating within the first cavity.

4,174,505
DIRECTIONAL PSK MODULATION AND DEMODULATION SYSTEM

Lester R. Querry, Laurel, Md., assignor to Digital Communications Corporation, Gaithersburg, Md.

Filed Apr. 26, 1978, Ser. No. 900,535
Int. Cl.² H04L 27/20, 27/22
U.S. Cl. 332—9 R 18 Claims

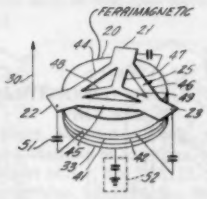


12. A method of producing a PSK signal in which said PSK signal carries information encoded as the direction of a phase transition comprising the steps of:
- providing a carrier of determined frequency,
- altering said carrier frequency for a predetermined period in one sense or another in response to a data signal of one kind or another to produce a gradual phase transition of ϕ in one direction or $-\phi$ in an opposite direction where ϕ is 180° or an integer multiple thereof and then
- returning said carrier frequency to said determined frequency.

4,174,506
THREE-PORT LUMPED-ELEMENT CIRCULATOR COMPRISING BYPASS CONDUCTORS

Hiroshi Ogawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 862,833
Claims priority, application Japan, Dec. 24, 1976, 51-155939
Int. Cl.² H01P 1/38
U.S. Cl. 333—1.1 4 Claims

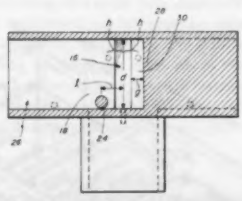


1. A three-port lumped-element circulator comprising:
three ports;
a ferrimagnetic piece having a principal surface and a predetermined point on said principal surface;
means for producing a magnetic field substantially perpendicularly of said principal surface;
three first conductors connected to the respective ports and to one another at three points of connection to enclose an area of said principal surface; and
three second conductors connected to one another and to the respective points of connection and placed in said area and on said predetermined point;
said ports, said first conductors, and said second conductors being arranged on said principal surface substantially in a geometric configuration having a threefold axis of rotational symmetry that passes perpendicularly of said principal surface through said predetermined point.

4,174,507
FOUR-PORT MAGIC TEE HAVING CAVITY STRUCTURE AT FOURTH PORT

Paul T. K. Young, Westwood, Mass., assignor to Microwave Development Labs., Needham Heights, Mass.

Filed Nov. 30, 1977, Ser. No. 855,966
Int. Cl.² H01P 5/20
U.S. Cl. 333—122 9 Claims



1. A multi-port electromagnetic coupling device having a plurality of arms meeting at a common junction of the device and including two aligned side arms, each side arm defining a port of the device and have predetermined power divisions therebetween, a third arm extending orthogonally to the side arms defining a third port of the device, and the device having a fourth port at said junction; and an energy coupling and matching structure extending over said fourth port having a coupling section extending from one side of said fourth port and a matching section extending from the opposite side of said fourth port, said matching section having walls including an end wall defining a cavity open to said coupling section and

having a predetermined depth extending from the edge of said fourth port on said opposite side to said end wall.

4,174,508

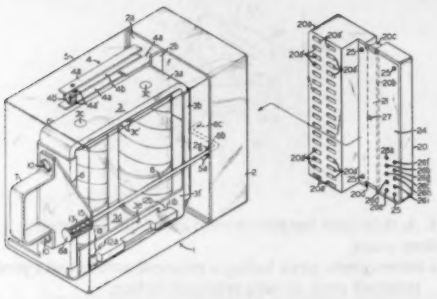
RELAY LATCHING APPARATUS

William J. Lichtenberger, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 10, 1978, Ser. No. 904,641

Int. Cl.[2] H01H *9/02*

U.S. Cl. 335—202 **10 Claims**



1. A latching arrangement for plug-in relays comprising, a mounting sub-base for receiving a relay base, a cover for enclosing the magnetic and electrical relay structure, a spring biased push rod having one end extending beyond the outer surface of said cover and having an intermediate portion passing along the side of said cover and having the other end communicating with an apertured slot formed in said relay base, an elongated leaf spring carried by said mounting sub-base and having its ends slightly protruding beyond the outer edges of said mounting sub-base, and locking means formed on said relay base for engaging the ends of said elongated leaf spring for latching said relay base to said mounting sub-base when the relay base is plugged into said mounting sub-base.

4,174,509

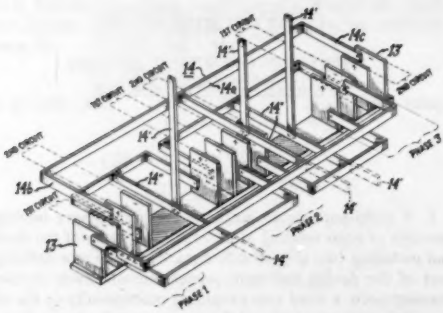
FURNACE TRANSFORMER HAVING A LOW-VOLTAGE INTERNALLY-CONNECTED DELTA WINDING

Werner Bach, Pittsfield, and George Kardasen, Jr., Dalton, both of Mass., assignors to General Electric Company

Filed Dec. 29, 1977, Ser. No. 865,700

Int. Cl.[2] H01F *33/00*

U.S. Cl. 336—12 **8 Claims**



1. A high-current transformer having an internal delta closure comprising:

a plurality of low-voltage windings concentrically arranged within a transformer casing around corresponding high-voltage windings on each leg of a three-leg electromagnetic core, each leg providing one phase of a three-phase arrangement, each phase consisting of at least one pair of first and second parallel circuits, each of said parallel circuits having a positive and a negative end;

a vertical bus bar array connecting with each of said positive and negative ends;

a first plurality of bus bar connectors within the transformer casing connecting the positive and negative circuit ends in a delta connection by coupling the ends of the first circuit in the first phase to the ends of the second circuit in the second phase and the ends of the first circuit in the third phase on one side of the bus bar array; and

a second plurality of bus bar connectors coupling the ends of the second parallel circuit in the first phase to the ends of the first parallel circuit in the second phase and the ends of the second parallel circuit in the third phase on another side of the bus bar array.

4,174,510

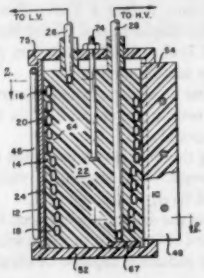
RF TRANSFORMER

James L. Smith, Naperville; Harold W. Helenberg, Calumet City, and Dennis J. Kilsdonk, Joliet, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,162

Int. Cl.[2] H01F *27/02, 27/28*

U.S. Cl. 336—62 **7 Claims**



1. An RF transformer, comprising: a can-type secondary, a tapered primary coil encapsulated in epoxy contained within and slip-fitted into said secondary, a constant separation between said encapsulant and said secondary, a gap between said primary and said secondary at one end of said coil is smaller than at the other end and said gap generally tapers between said two ends, and an insulative fluid filling the separation between said encapsulated coil and said can-type secondary.

4,174,511

BIMETAL DEVICE WITH AN ELECTRICAL HEATING ELEMENT

Heinrich Knapp, Leonberg; Franz-Ulrich Bosch, Stuttgart, and Gunther Schnepf, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,318

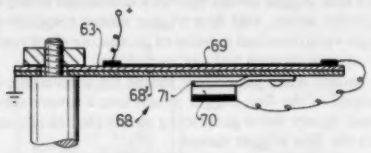
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712951

Int. Cl.[2] H01H *71/16*

U.S. Cl. 337—107 **2 Claims**

1. A bimetal device for use in a motor vehicle injection fuel device for controlling the air-fuel mixture during starting and warm-up of the engine comprising, in combination, a bimetallic base, a thin insulating layer on said bimetallic base, at least one electrical resistance heating element on said insulating layer in heat transfer relationship with said bimetallic base, a PTC resistor supported on said bimetallic base out of heat transfer

relationship therewith and serially connected with said at least one resistance heating element and means for connecting said



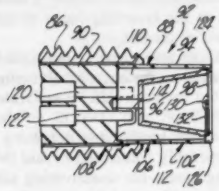
serially connected PTC resistor and said resistance heating element with an associated source of electrical power whereby said bimetal device can be held at a certain temperature.

4,174,512

FAST RESPONSE TEMPERATURE SENSOR

Albert Blatter, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 5, 1977, Ser. No. 857,558
Int. Cl.[2] H01C *7/00*
U.S. Cl. 338—25 **15 Claims**



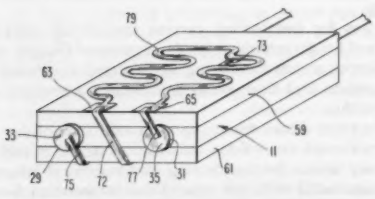
1. A temperature sensor for sensing the temperature of a fluid comprising a base member having at least first and second support arms thereon, fin means formed of a thin disc having a high surface area to mass ratio fixedly mounted on said first and second support arms whereby said fluid to be sensed may flow over the top and bottom surface of said fin means, semiconductor means mounted on said fin means in electrical contact therewith and having the characteristic of changing resistance with changes in temperature, a first output conductor connected to said fin means, a second output conductor electrically insulated from said fin means and connected to the surface of said semiconductor means remote from the surface of said semiconductor means in electrical contact with said fin.

4,174,513

FOIL TYPE RESISTOR WITH FIRMLY FIXED LEAD WIRES

Charles L. Wellard, Oaks, Pa., assignor to American Components Inc., Conshohocken, Pa.

Filed Apr. 5, 1978, Ser. No. 893,286
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—312 **7 Claims**



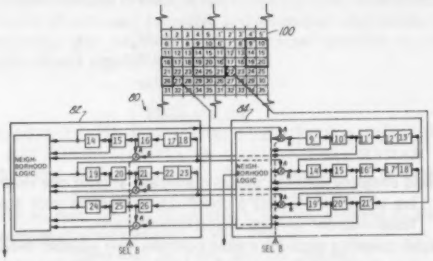
1. A metal foil type resistor assembly comprising in combination: a base means having channels formed therein, said channels opening to a first side of said base means, lead wires disposed in said channels and formed to be accessible for making electrical connections thereto; a first substrate means having an upper side and a lower side and having a metal configuration secured to its upper side, said metal configuration formed to have at least two termination lands and formed to provide electrical resistance, said first substrate means secured at its lower side to said first side of said base means; connecting wire means connecting each of said lead wires with an associated termination land.

4,174,514

PARALLEL PARTITIONED SERIAL NEIGHBORHOOD PROCESSORS

Stanley R. Sternberg, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 742,127, Nov. 15, 1976. This application Jun. 26, 1978, Ser. No. 919,171
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 MA **14 Claims**



1. Apparatus for generating a transformation of a first data matrix to form a second data matrix wherein the value of each data element is a function of the values of the elements in the neighborhood of the equivalent data element in the first matrix, comprising:

a plurality of serial neighborhood processors;

means for providing said first data matrix to said plurality of serial neighborhood processors with each serial processor receiving a plurality of adjacent columns of the matrix in a row by row raster;

connections between adjacent serial processors; and

means for controlling the serial processors to cause them to each utilize neighborhood information stored in an adjacent processor when generating the transform of a data element having neighboring elements in the columns processed by such adjacent processor, whereby said plurality of serial processors can simultaneously process separate and adjacent columns of the same matrix.

4,174,515

DEVICE FOR TRANSMISSION OF MEASUREMENT VALUES

Rene Marzolf, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 850,708
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652122
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 **20 Claims**

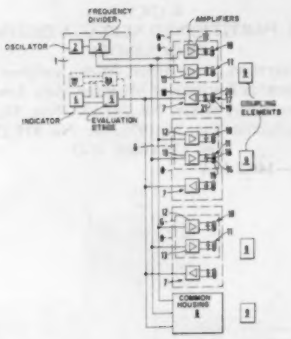
1. A device for transmission at least of one measurement value from a moveable object to a object stationary relative to the latter, particularly from a motor vehicle wheel to the vehicle frame of a motor vehicle, with a transmitting stage and

a receiving stage, which both are secured on the stationary object and a coupling element which is secured on the moveable object and via which the receiver is able to be applied with a measuring value signal, comprising

a transmitting stage means for transmitting two transmission frequency signals of different frequencies,

at least one coupling element means for mixing the two different frequencies and for transmitting at least one signal with a mixing frequency,

a receiving stage means for being responsive to the at least one signal with a mixing frequency transmitted from said coupling element means,



said coupling element means comprises at least one oscillating circuit containing a construction element with a non-linear-current voltage characteristic curve,

said coupling element means contains two parallel oscillating circuits including said at least one oscillating circuit, one of said parallel oscillating circuits lies at a frequency within a frequency range which is predetermined by the transmission frequencies, and the other of said circuits is tuned to the mixing frequency, and

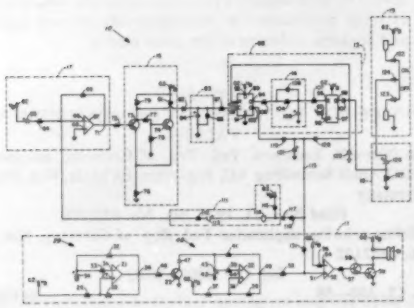
said construction element with a non-linear current-voltage characteristic curve connects both of said two parallel oscillating circuits with each other.

4,174,516

ALARM DEVICE

Mark R. Cleary, Omaha, Nebr., assignor to Jubilee Manufacturing Co., Omaha, Nebr.

Filed Dec. 5, 1977, Ser. No. 856,960
Int. Cl.[2] B60R *25/10*; G08B *13/08*
U.S. Cl. 340—63 **14 Claims**



1. An alarm device for use in conjunction with automobiles having electrical systems, said alarm device comprising:

(a) electric power connection means for connecting the device to the automobile electrical system;

(b) a first trigger means operably connected to the electrical power means, said first trigger means responsive to voltage variations and capable of producing electrical signal in response to such voltage variations;

(c) square wave generating means for converting electrical signal of the first trigger means into a square wave signal, said square wave generating means electrically connected to the first trigger means;

(d) siren means for sounding a siren in response to said activating means and electrically connected to said activating means, said siren means having:

a first operational amplifier circuit including an inverting and non-inverting input, and an output;

a second operational amplifier circuit including an inverting and non-inverting input, and an output;

a first transistor having a base, emitter, and collector, said first transistor electrically connected between said first operational amplifier circuit and said second operational amplifier circuit;

and positive voltage biasing means for positively biasing the non-inverting inputs of said first and second operational circuits, wherein the output of said first operational amplifier circuit is connected to the base of said first transistor, and the collector of said first transistor is connected to the inverting input of said second operational amplifier circuit;

(e) activating means responsive to the square wave signal for activating said siren means, said activating means electrically connected between said square wave means and said siren means;

(f) arming means for arming and dearming said first trigger means, and operably connected to said first trigger means;

(g) a first timing means for deactivating said siren means at some preset period beyond the time when said siren means is activated, said first timing means electrically connected to the siren means;

(h) a second timing means providing a delay time interval between the time when the arming means is activated, said second timing means electrically connected to the first trigger means; and

(i) a third timing means providing a delay interval between the time said activating means produces an activating signal and the time set siren means is activated, said third timing means electrically connected to the activating means.

4,174,517

CENTRAL SYSTEM FOR CONTROLLING REMOTE DEVICES OVER POWER LINES

Jerome Mandel, 15601 Whiteoak La., Huntington Beach, Calif. 92647

Filed Jul. 15, 1977, Ser. No. 816,015
Int. Cl.[2] H04B *3/54*; H04M *11/00*
U.S. Cl. 340—310 A **9 Claims**

1. A system for use in a facility equipped with a common electrical system for controlling, from a central location, the operation of one or more remote devices, comprising:

a central control unit located within said facility and including:

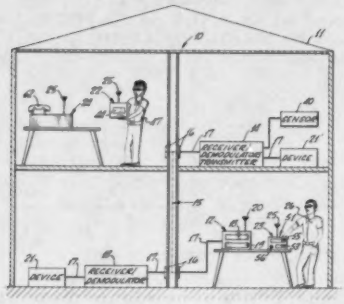
means for maintaining current time-of-day information and for generating a signal indicative of the time-of-day;

memory means for storing user-entered command information and time-of-day information associated therewith;

processor means for comprising said time-of-day signal with said time-of-day information stored in said memory means for transferring said command information associated with said time-of-day information from said memory means in the presence of a time match; and

a modulator responsive to said stored command information transferred from said memory means for modulat-

ing command signals onto a carrier signal and for coupling said carrier signal directly to said electrical system; and



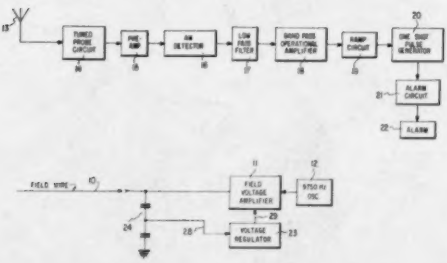
a receiver/demodulator unit coupled to said electrical system and to a remote device for receiving and demodulating command signals from said central control unit and for controlling the operation of said remote device.

4,174,518

INTRUSION WARNING SYSTEM

Ronald W. Mongeon, San Jose, Calif., assignor to Stellar Systems, Inc., Santa Clara, Calif.

Filed Jul. 28, 1977, Ser. No. 820,014
Int. Cl.[2] G08B *13/24*
U.S. Cl. 340—561 **7 Claims**



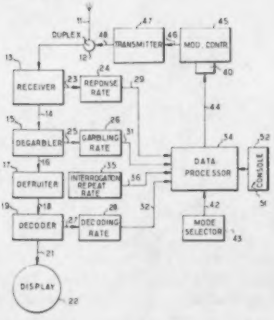
1. In an intrusion warning system for indicating the presence of an intruder into a given area comprising in combination: means for producing a quasi-stationary electric field along at least a portion of the perimeter of said area including a long field wire extending along said portion of the perimeter of said area with said field wire being mounted on and extending between a plurality of fence posts by means of respective insulators so that said field wire is insulated from ground, and first circuit means connected to said field wire for producing an output signal having a wavelength which is very long compared to the length of said field wire and a frequency which is in the range of from 1–40 KHz, said field circuit means including an oscillator circuit for producing an output signal having said frequency in the range of from 1–40 KHz, a first amplifier having an input connected to receive the output signal of said oscillator circuit and an output connected to said field wire, and voltage regulating means, having an output connected to said first amplifier, for regulating the output voltage from said first amplifier; a receiving antenna within said area for receiving said electric field; a second amplifier having an input connected to said antenna; AM detector means, responsive to an output signal from said second amplifier, for detecting changes in the received and amplified electric field signals and for producing an output signal corresponding to same; second circuit means, including voltage amplifying means and filter means, for amplifying said output signal from said detector means and for passing only any low frequency component of said output signal from said detector which is in the range from approximately 0.2 to 2 Hz due to a disturbance of said electric field caused by movement of an intruder; threshold circuit means, responsive to an output signal from said second circuit means, for producing an output signal whenever said output signal from said second circuit means exceeds a predetermined threshold value; and means, responsive to said output signal from said threshold circuit means, for providing an alarm indicating the disturbance of said electric field by an intruder; the improvement wherein: said first amplifier has an output stage including a transistor having an emitter connected to ground, a base connected to receive the output signal from said oscillator circuit and a collector connected to said output of said regulating means via an impedance, and to said field wire; and said regulating means comprises means responsive to said output voltage from said first amplifier for providing a controlled supply voltage to said output stage of said first amplifier including: a capacitive voltage divider connected between the output of said first amplifier and ground; an operational amplifier having an inverting input connected to an output of said capacitive voltage divider, a non-inverting input connected to a source of reference potential, and an output; and means for connecting said output of said operational amplifier to said output of said regulating means.

4,174,519

METHOD FOR THE IMPROVED UTILIZATION OF RESPONSE SIGNALS IN A SECONDARY RADAR SYSTEM AND A SECONDARY RADAR SYSTEM FOR IMPLEMENTING THE METHOD

Pierre R. Poli, Issy les Moulineaux, France, assignor to Electronique Marcel Dassault, Paris, France

Filed Oct. 23, 1978, Ser. No. 953,343
Claims priority, application France, Oct. 26, 1977, 77 32313
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **13 Claims**



5. In a secondary radar system including a ground-based radar station having interrogator means for transmitting interrogation signals consisting of time-spaced pulse pairs, the time interval T between pulses of a pair being characteristic of the interrogation, a transponder means aboard aircraft, said transponder means being of the type providing response signals to all interrogation signals having a time interval T comprises in a nominal time interval, response signals to a percentage of interrogation signals for ranges of time interval T greater and/or lesser than the nominal time interval, and no responses to interrogation signals having time interval T beyond predetermined limits, said station having a receiver means for receiving said response signals,

the improvement comprising means for varying the time interval T between the pulses of an interrogation signals as a function of the number of response signals and/or the

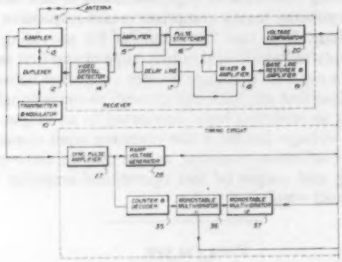
time relationship of the response signals received at the ground-based radar station so as to improve reception decoding of response signals in accordance with air traffic conditions in azimuthal zones.

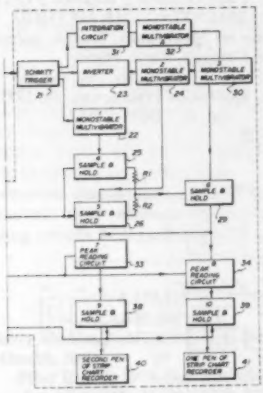
4,174,520

RADAR ALTIMETER FOR TROPICAL AREAS

Ray L. Westby, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Feb. 13, 1978, Ser. No. 877,308
Int. Cl.[2] G01S *9/12*
U.S. Cl. 343—13 R **1 Claim**





1. A radar altimeter system for measuring from an aircraft flying above tropical forest areas, the height of the ground and the height of the forest canopy above the ground comprising:

(a) a transmitter and antenna system for beaming a series of transmitted pulses towards the ground from an aircraft,

(b) a receiver for detecting return pulses from the ground and the forest canopy,

(c) timing means for measuring, in relation to the transmitted pulse, the time of arrival at the beginning and end of each received pulse and averaging these times,

(d) means for examining the received pulse duration and preventing pulses having a shorter time duration than a predetermined time from passing further in the system, and

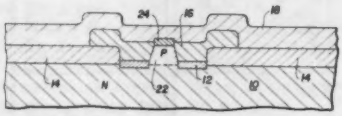
(e) means for examining a selected number of pulses and coupling the voltage derived from the received pulse having the longest time of arrival to an output to give an indication of the ground level and the voltage derived from the received pulse having the shortest time of arrival to an output to give an indication of the forest canopy level.

4,174,521

PROM ELECTRICALLY WRITTEN BY SOLID PHASE EPITAXY

Ronald G. Neale, Indian Harbour Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 6, 1978, Ser. No. 893,930
Int. Cl.[2] G11C *11/36*; H01L *21/20*
U.S. Cl. 357—45 **36 Claims**



32. A semiconductor structure comprising:

a layer of single crystal semiconductor material;

a alloy layer of a metal and said semiconductor material;

a doped amorphous layer of said semiconductor material on said alloy layer;

a contact layer of contact material on said amorphous layer;

a doped single crystal column of said semiconductor material on said single crystal layer surrounded laterally by said alloy and amorphous layers; and

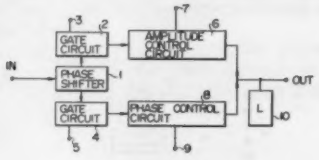
a layer of said alloy between said column and said contact layer.

4,174,522

COMPOSITE COLOR SIGNAL-HANDLING CIRCUIT

Shinichiro Taguchi, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 12, 1977, Ser. No. 841,598
Claims priority, application Japan, Oct. 16, 1976, 51-123432
Int. Cl.[2] H04N *9/12*
U.S. Cl. 358—35 **4 Claims**



1. A signal-handling circuit comprising: means for separating a composite signal into first and second component signals by time division; means for controlling the amplitude of said first signal component separated by said signal-separating means; means for controlling the phase of said second component signal separated by said signal-separating means; and means for adding together output signals from said means for controlling the phase and from said means for controlling the amplitude, whereby a difference between the phase distortions of said first and second component signals is eliminated.

4,174,523

FLAT DISPLAY DEVICE

Frank J. Marlowe, Kingston, and Charles H. Anderson, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 16, 1976, Ser. No. 705,926
Int. Cl.[2] H01J *29/72, 29/08, 31/08*
U.S. Cl. 358—67 **11 Claims**

1. An electron display device comprising

an evacuated envelope having a viewing window,

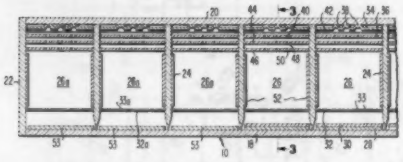
a phosphor screen along the inner surface of said window,

means in said device for generating a plurality of beams of

electrons and directing said beams along paths at least portions of which extend toward said window so that at least some of said beams will impinge on said phosphor screen,

means along the portions of the paths which extend toward said window for simultaneously deflecting said beams so that the beams which impinge on said phosphor screen will each scan a portion of the phosphor screen,

means for substantially continuously detecting the position of at least one of said beams as the beam is deflected, wherein said detecting means comprising means, including a detector electrode upon which the beam impinges as the beam is deflected, for generating a series of current pulses as the beam is deflected with the time between the pulses providing an indication of the position of the beam, and



means whereby the beam intermittently impinges on the detector electrode, said means whereby the beam intermittently impinges on the detector electrode including a mask extending across the detector electrode, said mask having a plurality of spaced openings therethrough through which the beam passes as the beam is deflected.

4,174,524

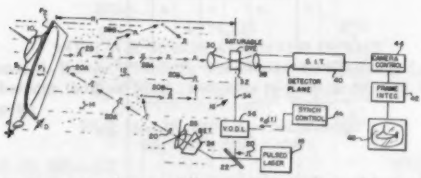
ULTRA HIGH SPEED GATED PULSE OPTICAL IMAGING SYSTEM

Steven E. Moran, Lakeside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 25, 1978, Ser. No. 945,721

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—95 **14 Claims**



1. Apparatus for providing an image of an object when a diffusive medium is located between said apparatus and said object, said apparatus comprising:

means for projecting successive pulses of coherent light through said medium to said object, each of said coherent light pulses having a time duration in the range 10^{-12}–10^{-10} seconds;

means for selectively receiving light transmitted through said medium, including light of said coherent light pulses which is reflected from various light reflective surfaces of said object;

optical shutter means selectively positioned in relation to said receiving means for allowing light transmitted through said medium to be received by said receiving means during shutter activation time periods, said shutter activation time periods being in the range 10^{-12}–10^{-10} seconds, a shutter activation time period occurring while a coherent light signal is being coupled to said optical shutter means;

synchronous means coupled between said pulse projecting means and said optical shutter means for commencing a shutter activation time period at the conclusion of a pulse travel time period, said pulse travel time period commencing when a given one of said coherent light pulses is projected by said pulse projecting means, the duration of said pulse travel time period being equal to the minimum time required for a wavefront of said given coherent light pulse to travel through said medium from said pulse projecting means to a selected one of said light reflective surfaces of said object, and then from said selected light reflective surface to said receiving means;

means cooperating with said receiving means for providing sets of light responsive signals, each of said sets representing an image of light reflective surfaces of said object which are included in one of one or more discrete viewing spaces;

storage means for storing said sets of light responsive signals; and

display means for combining all of the images represented by said sets of light responsive signals to provide an image of said object.

4,174,525

TELEVISION CAMERA HAVING LOW-FREQUENCY NOISE CORRECTION

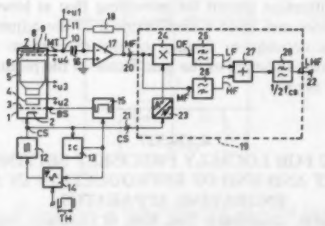
Johannes A. B. Dechering, and Martinus F. A. M. Geurts, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,233

Claims priority, application Netherlands, Dec. 1, 1976, 7613357

Int. Cl.[2] H04N *5/34*

U.S. Cl. 358—217 **12 Claims**



1. A television camera comprising a television pick-up tube and a correction circuit for low frequency signal noise, said television pick-up tube including an electron gun comprising a cathode, and control, and an accelerating electrode respectively, a target plate disposed opposite said gun, a mesh electrode disposed near the target plate and causing low frequency noise, and a picture signal output of the pick-up tube coupled to the target plate; an oscillator coupled to said cathode, wherein the peak-to-peak value of the oscillator signal on the cathode exceeds the local maximum potential variation on the target plate occurring at a local maximum illumination present in a scene to be televised and the oscillator frequency is at least equal to twice the highest standardized picture signal, frequency, and an amplitude-demodulation circuit means coupled to said picture signal output for obtaining an unmodulated noise corrected picture signal.

4,174,526

TELEVISION CAMERA COMPRISING A DIAPHRAGM CONTROL AND A CONTROLLABLE PICTURE SIGNAL AMPLIFICATION CIRCUIT

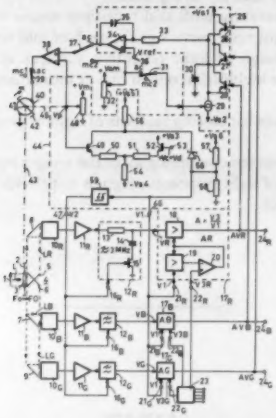
Martinus F. A. M. Geurts, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,079

Claims priority, application Netherlands, Feb. 21, 1977, 7701811

Int. Cl.[2] H04N *5/34*

U.S. Cl. 358—219 **9 Claims**



1. A television camera comprising a diaphragm control and a gain controllable picture signal amplification circuit for keeping a picture signal value substantially constant at varying scene light intensities, an adjusting element for adjusting the diaphragm opening, the diaphragm control being mainly operative at a scene having higher light intensities and the control of the picture signal amplification circuit mainly taking place at lower scene light intensities, an electronic control circuit coupled to the adjusting element, said control circuit having a first signal output coupled to a control signal input of the picture signal amplification circuit for providing that at lower scene light intensities and upon a readjustment of the adjusting element and a consequent change of the diaphragm opening simultaneously a change of the gain factor of the picture signal gain circuit occurs.

4,174,527

METHOD FOR LOCALLY PRECISELY SETTING THE START AND END OF REPRODUCTION IN AN ENGRAVING APPARATUS

Klaus Schaefer, Rendsburg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

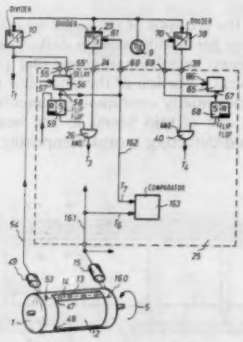
Filed Feb. 3, 1978, Ser. No. 874,790

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705993

Int. Cl.[2] H04N *1/26*

U.S. Cl. 358—267 **7 Claims**

1. The method for the precise setting of a start and end of the reproduction of an image pattern wherein the image pattern mounted on a scanning cylinder is opto-electronically scanned line by line by a scanning member to obtain an image signal and wherein the image pattern is recorded on a recording cylinder by a recording member controlled by said image signal comprising the steps of setting a start mark on the scanning cylinder which determines the desired point at which scanning shall begin in each line of said image pattern, scanning said start mark by said scanning member to obtain a first control signal, producing a revolution mark pulse of the cylinder generating a second scanning start control signal by time delaying said revolution mark pulse and to set the scanning start for subsequent reproduction effecting coincidence for the first and



second control signals with the aid of comparison means by altering said time delay during a test run.

4,174,528

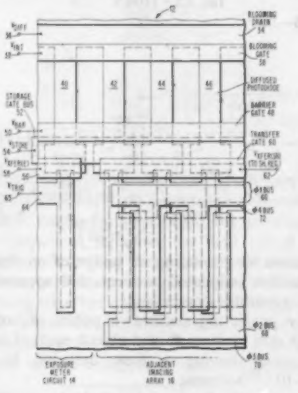
EXPOSURE CONTROL FOR DOCUMENT SCANNER ARRAYS

James M. White, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,942

Int. Cl.[2] H04N *1/40, 1/10, 1/24, 3/14*

U.S. Cl. 358—280 **12 Claims**



1. In a document scanner, the combination comprising:

a scanner array including an exposure control section and a document information receiving section;

means for concurrently imaging a reference indicia onto said exposure control section, and the document onto said document information receiving section; and

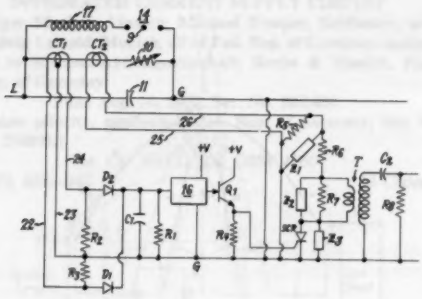
means for controlling the amount of time said document information receiving section processes the imaged document as a function of the time said exposure control section senses the imaged reference indicia.

4,174,529

PROTECTIVE CIRCUIT FOR ZINC OXIDE VARISTORS

John R. Hamann, Richmond, Mass., assignor to General Electric Company, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,529
Int. Cl.[2] H02H 7/16
U.S. Cl. 361—16 21 Claims



1. A protective circuit for zinc oxide varistors comprising in combination:

at least one zinc oxide varistor connected within an electric circuit;

a triggered switching device electrically coupled in shunt relationship with the varistor for bypassing current from the varistor under a condition of varistor overload;

at least one current sensor electrically connected within the circuit for sensing current flow through said varistor and for generating an electric signal in response to the varistor overload condition, said current sensor being directly connected to an input of a rectifier circuit having an output directly connected to a first capacitor and to a first resistor for generating a voltage across the capacitor which is directly proportional to the energy dissipated within the varistor during said overload condition; and

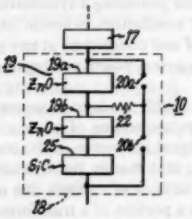
pulse generator circuit means for providing a high voltage pulse to the triggered device for causing the triggered device to become conductive when said overload condition occurs.

4,174,530

VOLTAGE SURGE ARRESTER DEVICE

James S. Kresge, Pittsfield, and Eugene C. Sakshaug, Lanesborough, both of Mass., assignors to General Electric Company

Filed Jan. 20, 1978, Ser. No. 870,869
Int. Cl.[2] H02H 3/22
U.S. Cl. 361—127 9 Claims



1. An overvoltage surge arrester comprising:

at least one high-exponent varistor having an exponent greater than 10 for electrical connection between a voltage line and ground;

at least one low-exponent varistor having an exponent less than 10 in series with said high-exponent varistor for providing a more rapid voltage increase than for the high-exponent varistor; and

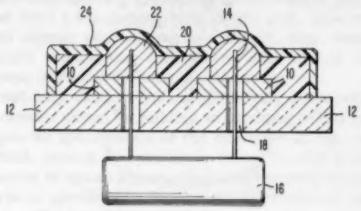
at least one shunt gap shunting said low-exponent varistor and a portion of said high-exponent varistor for reducing the arrester voltage during a condition of electrical overvoltage.

4,174,531

PRINTED CIRCUIT BOARD WITH INCREASED ARC TRACK RESISTANCE

Donald C. McCarthy, Delran, and Martin Rayl, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,401
Int. Cl.[2] H05K 1/04
U.S. Cl. 361—411 11 Claims



1. A printed circuit board consisting essentially of:

(a) an electrically insulative substrate;

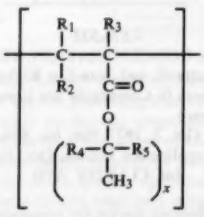
(b) a conductive network layer bonded to the substrate;

(c) a solder resist material adhered to selected areas of the network layer and the substrate;

(d) solder bonded to selected areas of the network layer;

(e) components affixed by means of electrical leads to the conductive layers by the solder; and

(f) an acrylic resin coated over the substrate, network layer, solder and solder resist material wherein the acrylic resin is a polymer having the recurring unit of the formula:



wherein x of each unit is independently selected from integers of 0 to 15 and each R_1, R_2, R_3, R_4 and R_5 is independently selected from the group consisting of H, $-CH_3$ and $-C_2H_5$ and whereby the acrylic resin coating increases the arc track resistance of an electrical potential applied to the circuit board.

4,174,532

PORTABLE LIGHTING FIXTURE

Richard L. Kelley, 7 Elm Pl., Webster Groves, Mo. 63119

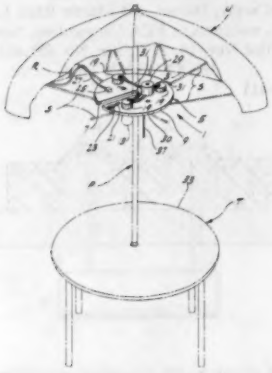
Filed May 20, 1977, Ser. No. 798,769
Int. Cl.[2] F21V 33/00, 21/08
U.S. Cl. 362—102 5 Claims

1. A portable lighting fixture for use with a patio umbrella and the like in which the umbrella is supported by a center pole having struts extending outwardly therefrom to the underside of the umbrella when the umbrella is in a raised position comprising:

a generally planar base of rigid material having a slot therein extending inwardly from an edge of the base toward and

slightly beyond the center thereof, said slot having a relatively constant width approximately equal to but greater than that of the center pole for receiving the pole to removably install the base below the underside of the umbrella about the pole, the latter being at the inward end of the slot and said base being supported by the struts in a generally horizontal plane;

said base having a maximum outside dimension less than the length of one of the umbrella struts for enabling the base to be installed on and removed from the umbrella by



passing it between two adjacent struts when the umbrella is in its raised position;

a plurality of electric light sources mounted on the underside of the base; and

power means adapted for connection to a source of electrical energy for supplying power to the light source thereby to illuminate the area beneath the umbrella, said power means including manually-operable switch means for selectively controlling the flow of electricity to the light sources thereby allowing the latter to be selectively energized and deenergized.

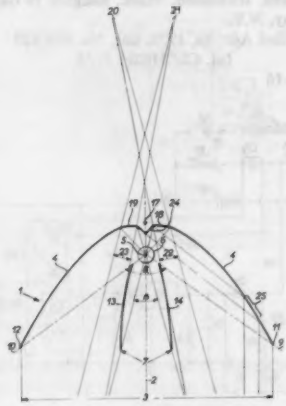
4,174,533

WAVEFLUX CONCENTRATION REFLECTOR

Emile Barthes, Montreuil, and Jean-Luc Richard, Puteaux, both of France, assignors to Compagnie des Lampes, Societe Anonyme, Paris, France

Filed Oct. 3, 1977, Ser. No. 838,475
Claims priority, application France, Oct. 21, 1976, 76 31685
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—346 **4 Claims**

1. An optical reflecting device for concentrating a waveflux produced by a luminous source into a beam of light having a main plane, said device comprising an outer trough-shaped reflector and an inner reflector, said outer reflector comprising, on each side of said main plane, adjacent first and second reflecting surfaces, and said inner reflector comprising, on each side of said main plane, a third reflecting surface, a transverse cross section of said luminous source comprising an emitting area, a transverse cross section of said main plane forming an axis of the beam of light, a transverse cross section of said first reflecting surface being described by an arc of a hyperbola extending between two ends and having a first focus coincident with said emitting area and a second focus, a transverse cross section of said second reflecting surface being described by a first arc of a parabola having an axis coincident with the axis of the beam of light, and a focus coincident with said emitting area, and a transverse cross section of said third reflecting surface being described by a second arc of a parabola having a focus coincident with said emitting area and an axis forming an angle with the axis of the light beam, said second arc of parabola being closer to the axis of said beam of light than to its axis, and the second focus of said arc of hyperbola being positioned at a crossing point of two straight lines passing by the respective ends of said arc of the hyperbola and



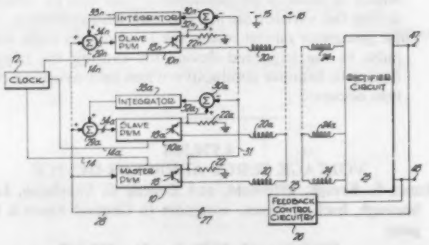
between said first arc of parabola and said second arc of parabola.

4,174,534

MASTER-SLAVE VOLTAGE REGULATOR EMPLOYING PULSE WIDTH MODULATION

Paul Kotlarewsky, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 20, 1978, Ser. No. 871,105
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—26 **15 Claims**



1. A pulse width modulation converter circuit for transforming a first DC voltage into a second voltage, wherein the magnitude of said second voltage is regulated by said converter circuit, said converter circuit comprising:

a clock means for providing a symmetrical train of pulses on each of n+1 conductors, wherein only one pulse occurs on any one of said conductors at any given instant in time, and wherein n is a positive integer equal to, or greater than, 1;

a master pulse width modulator means responsive both to the train of pulses on one of said n+1 conductors and to a feedback signal indicative of the magnitude of said second voltage, said master pulse width modulator means controlling the flow of current, due to said first DC voltage, through a portion of a transformer primary winding;

n slave pulse width modulator means, each said slave pulse width modulator means being responsive both to the train of pulses on one of said n+1 conductors, in a one-to-one relationship, and to an output control signal based both upon said feedback signal, indicative of the magnitude of said second voltage, and upon the difference in the magnitude of the charge passed by said master pulse width

modulator means and the charge passed by said respective slave pulse width modulator means, each said slave pulse width modulator means controlling the flow of current, due to said first DC voltage, through a portion of said transformer primary winding.

4,174,535

INTEGRATED CURRENT SUPPLY CIRCUIT

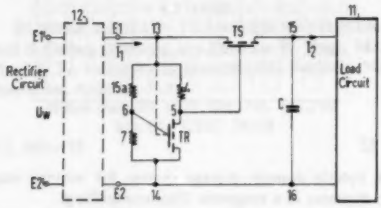
Ruediger Mueller, Munich; Michael Pomper, Schliersee, and Ludwig Leipold, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,498

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740763

Int. Cl.[2] **H02J** *1/04;* **G05F** *1/60*

U.S. Cl. 363—147 **12 Claims**



1. An integrated current supply circuit comprising:
(a) two input terminals;
(b) two output terminals having a capacitor connected therebetween;
(c) a lambda circuit means having a current voltage characteristic wherein a current through the circuit is low for a low applied voltage, said current rising to a maximum for a given applied voltage, and said current falling to a low value for higher applied voltages, said given applied voltage being between the low applied voltage and higher applied voltages;
(d) said lambda circuit means comprising
(i) a first field effect transistor (FET) whose one end of a source-drain path connects to one end of a series circuit having a load element connected to a source-drain path of a second field effect transistor (FET), a gate of the first FET connecting between the load element and second FET,
(ii) connection means connecting a gate of the second FET to a drain-side end of said series circuit;
(e) ends of series circuit being connected between said two input terminals;
(f) the other end of the first FET source-drain path connecting to one of said two output terminals; and
(g) the other of said two output terminals connecting to one of said two input terminals.

4,174,536

DIGITAL COMMUNICATIONS CONTROLLER WITH FIRMWARE CONTROL

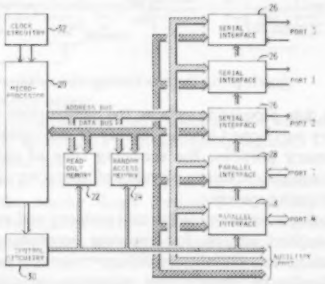
David P. Misunas, Brighton; Peter G. Jessel, and Robert G. Jacobsen, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 21, 1977, Ser. No. 761,126

Int. Cl.[2] **G06F** *3/04, 13/00*

U.S. Cl. 364—200 **34 Claims**

1. A digital data processor comprising
(a) processor means for operational control, said processor means consisting of computational means for performing arithmetic and logical operations on data items and communication means for transferring data items to and from said processor means;
(b) serial interface means operatively connected to said processor means for receiving signals representing first data from said processor means over said communication means and, upon receipt of said signals representing said first data, transmitting signals representing said first data in serial format to a first peripheral device, and for receiving signals representing second data in serial format from a second peripheral device and, upon receipt of said signals representing said second data, transmitting signals representing said second data to said processor means over said communication means;
(c) parallel interface means operatively connected to said processor means for receiving signals representing third data from said processor means over said communication means and, upon receipt of said signals representing said third data, transmitting signals representing said third data in parallel format to a third peripheral device, and for receiving signals representing fourth data in parallel format from a fourth peripheral device and, upon receipt of said signals representing said fourth data, transmitting signals representing said fourth data to said processor means over said communication means;
(d) read-only memory means operatively connected to said processor means for holding an encoding of bits providing a precise specification of the operation of said processor means, causing said processor means to control the transmission of signals representing data received at one of said serial or parallel interface means to another of said serial or parallel interface means;



(e) random-access memory means operatively connected to said processor means, providing temporary storage for use by said processor means and temporarily holding signals representing data received at one of said serial or parallel interface means, under control of said processor means while operating in the manner specified by said encoding of bits contained in said read-only memory means;
(f) control means operatively connected between said processor means and said read-only memory means, said random-access memory means, said serial interface means, and said parallel interface means providing generation of control signals enabling communication over said communication means between said processor means and said read-only memory means, random-access memory means, serial interface means, and parallel interface means;
(g) clock means operatively connected to said processor means and said control means, said clock means providing means for synchronizing the operation of said processor means and said control means; and
(h) said processor means operating in accordance with said encoding of bits contained in said read-only memory means to transfer from one of said serial or parallel interface means to another of said serial or parallel interface means both packets and single data items, wherein each of said packets contains a specification of the serial of parallel interface means to which it is to be transmitted and each of said single data items received at a serial or parallel interface means is transmitted to one or more serial or parallel

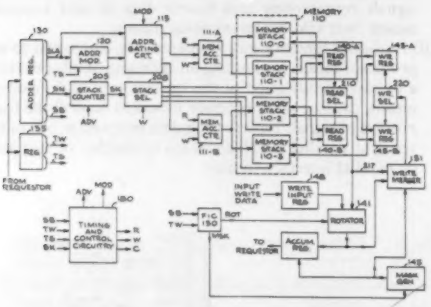
interface means in accordance with a specification contained in said random-access memory means or in said read-only memory means.

4,174,537

TIME-SHARED, MULTI-PHASE MEMORY ACCESSING SYSTEM HAVING AUTOMATICALLY UPDATABLE ERROR LOGGING MEANS

Ke-Chiang Chu, San Jose, and Richard S. Sharp, Santa Barbara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 784,352, Apr. 4, 1977, Pat. No. 4,138,720. This application May 31, 1977, Ser. No. 801,868
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



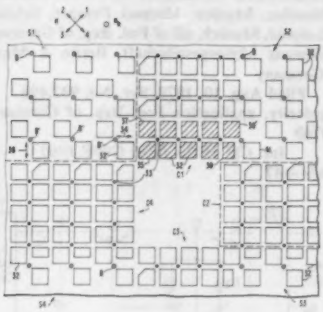
1. In a data processing system, the combination comprising:
a memory partitioned into a plurality of individually addressable memory portions, the accessing time of each memory portion requiring at least a plurality of operating cycles of said data processing system;
addressing means coupled to said memory and responsive to an applied address for initiating accessing of selected locations in a plurality of different memory portions over a plurality of consecutively occurring operating cycles in a manner such that the accessing of only a particular selected one of said memory portions is initiated during an operating cycle;
data accumulation means capable of simultaneously storing data read out from a plurality of said memory portions;
memory output means coupled to said memory and operative during a read operation for receiving data read out from each addressed selected location of a memory portion as it becomes available and operative during each of a plurality of said operating cycles for storing a predetermined portion of the received data from a selected one of said memory portions in a different designated location of said accumulation means until all of the predetermined portions of the received data read out from the addressed selected locations of said memory are simultaneously stored in said accumulation means;
said memory output means including error checking means for detecting the occurrence of a plurality of different types of errors which may occur in data read out from an addressed selected locaton of a memory portion and for producing error patterns corresponding thereto; and
error logging means coupled to said error checking means and responsive thereto for simultaneously storing indications of the occurrence of a plurality of different types of detected errors and for also storing the corresponding error pattern of a first predetermined type of error on a predetermined priority basis over that of a second predetermined type of error.

4,174,538

TWO-DIMENSIONAL BUBBLE DOMAIN MEMORY

Ashok K. Chandra; Hsu Chang, both of Yorktown Heights, and Chak-Kuen Wong, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,194
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **17 Claims**



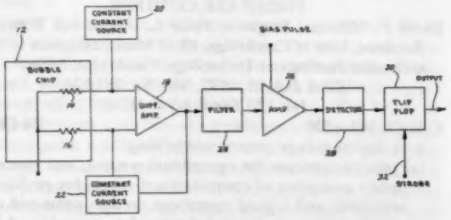
1. A bubble domain storage system for moving magnetic bubble domains in a magnetic film, comprising:
a plurality of storage arrays for storing bubble domains in said magnetic film arranged along x and y directions, each storage array being comprised of bi-directional shift registers for moving bubble domains in x and y directions, said shift registers being comprised of magnetic elements for moving said bubble domains in said x and y directions, wherein the magnetic elements have geometries such that bubble domains will move along them in either the x-direction or the y-direction depending upon the reorientation sequence of a magnetic field substantially in the plane of the magnetic elements,
magnetic translation means located between said storage arrays, said translation means including compressor circuits aligned with said shift registers for translating information in any of said shift registers to an aligned shift register in an adjacent storage array,
detection means for detecting bubble domains in said shift registers, said detection means comprising bubble domain sensing elements located between said storage arrays and disposed along said x and y directions for detection of bubble domains moving in said x and y directions.

4,174,539

MAGNETIC BUBBLE MEMORY DETECTOR-AMPLIFIER

Walter C. Timm, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 1, 1978, Ser. No. 956,769
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 **4 Claims**



1. A detector-amplifier for bubble memory devices of the

type having a dual output, one dummy and one active, comprising:

a differential amplifier, including a constant current source associated with each input and adapted to be connected with respective outputs of a bubble memory device,

a notch filter coupled to the output of said differential amplifier and tuned to eliminate signals at the frequency of the rotating magnetic field of a bubble memory device to be associated therewith,

an amplifier means connected with the output of said notch filter and including means responsive to a bias pulse to increase the gain of said amplifier,

a self biasing detector coupled to the output of said amplifier means, and

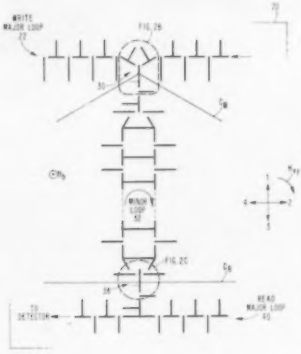
flip-flop means coupled to the output of said detector and including means responsive to a strobe pulse for gating an output signal.

4,174,540

BUBBLE DOMAIN TRANSFER SWITCHES

Mitchell S. Cohen, Ossining, and Emerson W. Pugh, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,734
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 **23 Claims**



1. A bubble domain device for selectively sending bubble domains along one of two propagation paths, comprising:

at least one magnetic element forming a propagation path for bubble domains as a magnetic drive field continuously rotates through a 360° cycle in a constant sense of rotation,

an electrical conductor for carrying current for determining which of said two paths will be followed by a bubble domain passing through said device,

means for reducing the amplitude of said magnetic drive field for at least a portion of its cycle,

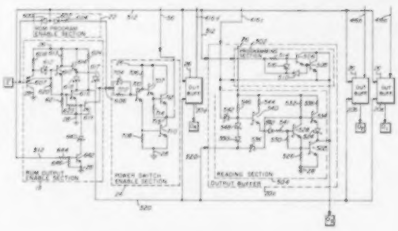
means for applying said current in said conductor while said drive field amplitude is reduced in order to effect path selection through said device, and means for applying a small constant magnetic field in a fixed direction while said rotating field is diminishing in amplitude.

4,174,541

BIPOLAR MONOLITHIC INTEGRATED CIRCUIT MEMORY WITH STANDBY POWER ENABLE

Charles R. Schmitz, Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 746,362, Dec. 1, 1976, abandoned. This application May 25, 1978, Ser. No. 909,334
Int. Cl.[2] G11C *8/00, 7/00*
U.S. Cl. 365—227 **16 Claims**



1. A monolithic integrated circuit comprising:

(a) a memory array;

(b) memory array addressing circuitry for addressing such array in accordance with addressing signals;

(c) a ground bus;

(d) a power enable circuit including a transistor having a Schottky barrier diode formed between the base and collector regions thereof, such Schottky transistor being coupled between the addressing circuitry and the ground bus, the base electrode of such transistor being adapted for coupling to an enable signal, such Schottky transistor electrically coupling or decoupling the addressing circuitry and the ground bus selectively in accordance with the enable signal to enable or inhibit current flow in the addressing circuitry selectively in accordance with such enable signal; and

(e) a semiconductor substrate having formed thereon the memory array, the memory array addressing circuitry, the ground bus and the power enable circuit.

DESIGN PATENTS

GRANTED NOV. 13, 1979

ERRATA

For CLASS	See PATENT NO.
D21–062	253,430

DESIGNS

NOVEMBER 13, 1979

253,376

DISPLAY RACK FOR OIL CANS

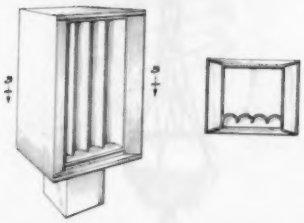
Richard P. Hornblad, Shorewood, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Sep. 5, 1978, Ser. No. 932,044

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—25



253,377

HASSOCK OR SIMILAR ARTICLE

Albert M. Spound, Tarzana, Calif., and Robert C. Day, Princeton, Mass., assignors to Charlton Company, Inc., Leominster, Mass.

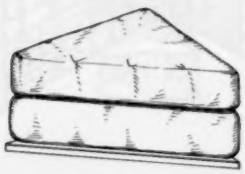
Continuation-in-part of Ser. No. 678,964, Apr. 21, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,680

The portion of the term of this patent subsequent to Jun. 12, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—36



253,378

HASSOCK OR SIMILAR ARTICLE

Albert M. Spound, Tarzana, Calif., and Robert C. Day, Princeton, Mass., assignors to Charlton Company, Inc., Leominster, Mass.

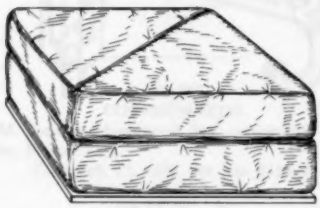
Continuation-in-part of Ser. No. 678,966, Apr. 21, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,682

The portion of the term of this patent subsequent to Nov. 13, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—36



253,379

SOFA

Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.

Filed Nov. 28, 1977, Ser. No. 855,249

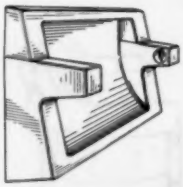
Term of patent 14 years

Int. Cl. D6—*01*

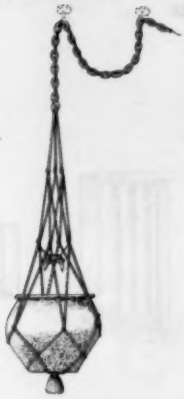
U.S. Cl. D6—62

253,380
HARDWARE SUPPORT
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jul. 17, 1978, Ser. No. 925,566
Term of patent 14 years
Int. Cl. D23—*02*; D8—*08*
U.S. Cl. D6—86

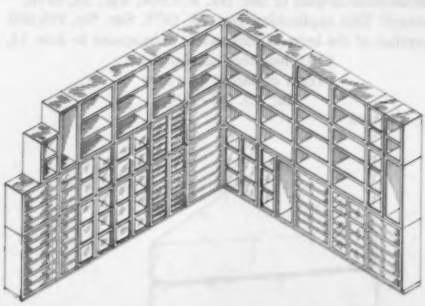
253,381
TISSUE HOLDER
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Oct. 12, 1977, Ser. No. 841,542
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



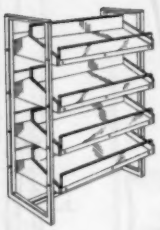
253,382
COMBINED HANGING PLANTER AND LIGHTS THEREFOR
Anthony J. Spruiel, 1210 34th St., Newport News, Va. 23607
Filed Jul. 29, 1977, Ser. No. 820,362
Term of patent 14 years
Int. Cl. D6—*06*; D11—*02*
U.S. Cl. D6—113



253,383
MULTIPLE SHELF AND CABINET UNIT
Giorgio Geli, Palestro St. 8, Senigallia, Italy
Filed May 23, 1977, Ser. No. 799,774
Claims priority, application Italy, Dec. 1, 1976, 526/76[U]
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169



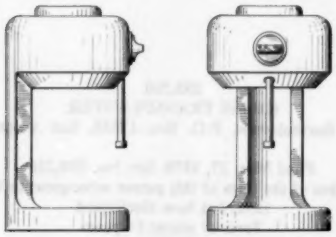
253,384
RACK
Marvin Glassenberg, 6857 N. Francisco Ave., Chicago, Ill. 60645
Filed May 26, 1978, Ser. No. 910,137
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



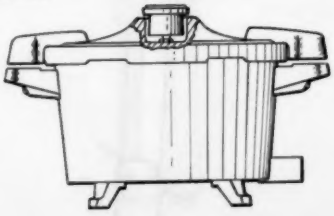
253,385
GLASS TUMBLER
Theodore M. Reyda, Saugatuck, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 14, 1977, Ser. No. 860,425
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—5

253,386
DECAL FOR CULINARY WARE OR THE LIKE
Patricia A. Luzier, Toledo, Ohio, assignor to Corning Glass Works, Corning, N.Y.
Filed May 16, 1977, Ser. No. 797,471
Term of patent 14 years
Int. Cl. D19—*08;* D07—*01*
U.S. Cl. D7—39

253,387
COFFEEMAKER
Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Feb. 27, 1978, Ser. No. 881,160
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—59

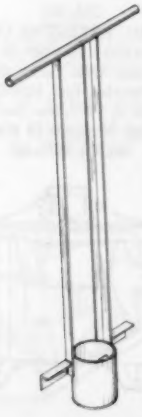


253,388
ELECTRIC PRESSURE COOKER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Mar. 7, 1977, Ser. No. 774,581
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—86

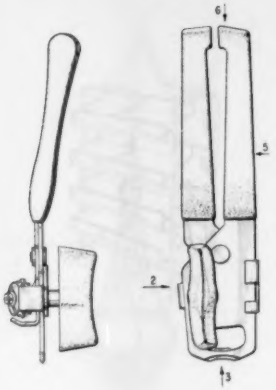


253,389
MARKER FOR HORTICULTURAL ITEMS
Leslie E. South, Jr., Dallas, Tex., assignor to Carscallen Nursery Label Company
Filed Sep. 16, 1977, Ser. No. 834,137
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D8—1

253,390
GRASS TRANSPLANTER
Glen W. Bartholomew, P.O. Box 17565, San Antonio, Tex. 78217
Filed Mar. 27, 1978, Ser. No. 890,226
The portion of the term of this patent subsequent to Oct. 10, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7



253,391
CAN OPENER
Paul Dreyer, Solingen-Widdert, Fed. Rep. of Germany, assignor to The Prestige Group Limited, London, England
Filed May 18, 1977, Ser. No. 798,268
Claims priority, application United Kingdom, Apr. 6, 1977, 979620
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—39



253,392
MOUNTING BRACKET
Gunnar Baltare, Livonia, Mich., assignor to Eaton Corporation
Filed Oct. 17, 1977, Ser. No. 842,635
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

253,393
FASTENER FOR RETICULATE FENCING PANELS
Harold G. Evans, R.R. #2, Wayne, Nebr. 68787
Filed Jul. 5, 1977, Ser. No. 812,458
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—370

253,394
COMBINED DISPENSING CONTAINER AND HOLDER THEREFOR
Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.
Filed Oct. 19, 1977, Ser. No. 843,468
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

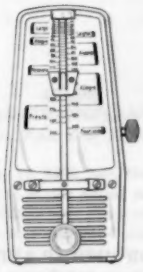
253,395
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,680
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

253,396
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,678
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

253,397
CAN OR SIMILAR ARTICLE
Gary K. Hasegawa, Chicago, and Carmen T. Mascia, Clarendon Hills, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,892
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

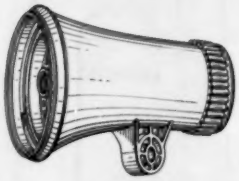
253,398
DISPENSING PUMP
Robert A. Niemeyer, Cincinnati, Ohio, and John Pardo, Yonkers, N.Y., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 14, 1977, Ser. No. 777,504
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—276

253,399
METRONOME
Fritz Härle, Sonnenweg 10, 7972 Isny-Neutrauchburg, Fed. Rep. of Germany
Filed Oct. 20, 1977, Ser. No. 843,788
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—43

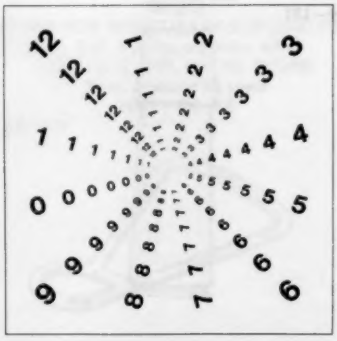


253,400
SMOKE DETECTOR
William W. Vander Wilt, Shawnee Mission, Kans., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Dec. 29, 1977, Ser. No. 865,750
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

253,401
SIREN ATTACHMENT FOR CYCLE-TYPE VEHICLES
Mason Benson, Red Bank, and James McIntosh, Sommerset, both of N.J., assignors to Carolina Enterprises, Inc., New York, N.Y.
Filed Jun. 22, 1978, Ser. No. 918,311
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



253,402
TIMEPIECE DIAL
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Nov. 1, 1977, Ser. No. 847,686
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

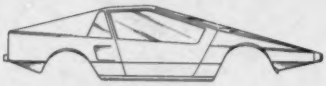


253,403
RING
Gabrielle Glueckselig, New York, N.Y., assignor to Artcarved Class Rings, Inc., New York, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,347
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—35

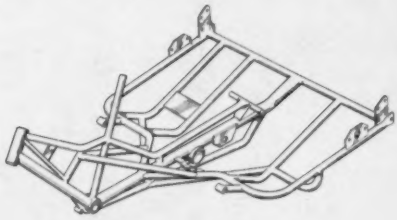
253,404
JEWELRY PENDANT OR SIMILAR ARTICLE
Joseph R. Gatti, 1350 Kelchner Rd., Bethlehem, Pa. 18017
Filed Apr. 26, 1978, Ser. No. 899,898
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

253,405
SCULPTURE
Lawrence F. Caulkett, 12207 Rochester Ave., Apt. 2, Los Angeles, Calif. 90025
Filed Oct. 11, 1977, Ser. No. 840,776
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

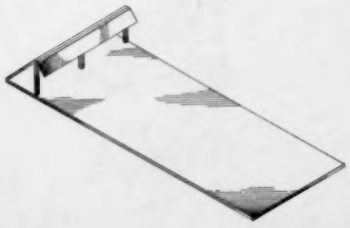
253,406
AUTOMOBILE BODY
Vito J. Carabetta, 124 W. Avenue 42, Los Angeles, Calif. 90065
Division of Ser. No. 876,854, Feb. 10, 1978. This application Oct. 10, 1978, Ser. No. 949,687
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90



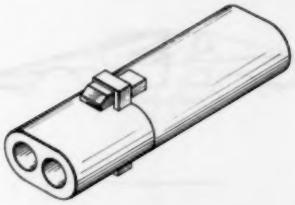
253,407
THREE-WHEELED VEHICLE FRAME
George C. Moore; Jodele Moore, both of 628 Brookway La., Las Vegas, Nev. 89109, and James M. Tipke, 2823 N. Perry St., Spokane, Wash. 99207
Filed Feb. 21, 1978, Ser. No. 879,712
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112



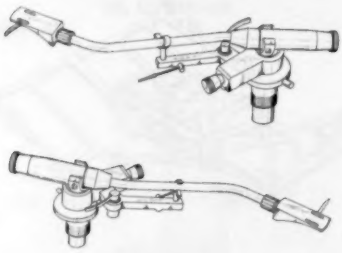
253,408
VEHICLE WHEEL CHOCK
Roy D. Sargent, 722 S. Sixth St., Brighton, Colo. 80601
Filed Oct. 3, 1977, Ser. No. 838,937
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217



253,409
ELECTRICAL CONNECTOR BLOCK ASSEMBLY
Donald F. Voelkert, Elkhart, Ind., assignor to ElecTroMation, Inc., Elkhart, Ind.
Filed Aug. 18, 1977, Ser. No. 825,773
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



253,410
PHONOGRAPH TONE ARM
Isao Sasaki, Tokyo, Japan, assignor to Nippon Columbia Co., Ltd., Tokyo, Japan
Filed Sep. 19, 1977, Ser. No. 834,378
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—27



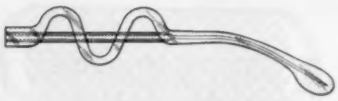
253,411
RADIO RECEIVER
Masanori Hamada, Yao, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Japan
Filed Jul. 28, 1977, Ser. No. 820,028
Claims priority, application Japan, Feb. 17, 1977, 52-5212
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

253,412
COMBINED RADIO AND TELEVISION SOUND RECEIVER OR THE LIKE
Kazumasa Takenaka, Moriguchi, and Shinzo Murakami, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 15, 1977, Ser. No. 806,634
Claims priority, application Japan, Dec. 17, 1976, 51-49316
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

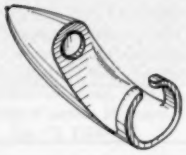
253,413
FORM FOR A CONCRETE TRACTOR WEIGHT
Lloyd L. Vandewater, Rte. 1, Box 98, Dexter, Iowa 50070
Filed May 18, 1977, Ser. No. 798,239
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—136

253,414
PERISCOPIC VIEWING DEVICE
Jorge J. Gomez, 351 E. 84th St., New York, N.Y. 10028
Filed Jun. 20, 1977, Ser. No. 808,253
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48

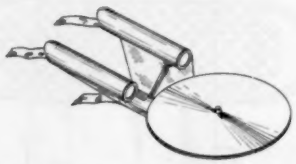
253,415
TEMPLE FOR SPECTACLES
Charles I. Solomon, P.O. Box 12495, San Antonio, Tex. 78215
Filed Aug. 22, 1977, Ser. No. 826,357
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—81



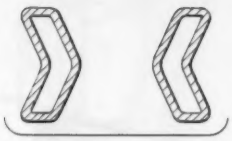
253,416
FINGER BALLPOINT PEN
John J. MacIntosh, 7301 Pomelo Dr., Canoga Park, Calif. 91307
Filed Mar. 28, 1978, Ser. No. 891,160
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41



253,417
KITE
David Infante, 6002 W. Encanto Blvd., Phoenix, Ariz. 85035
Filed May 9, 1977, Ser. No. 794,964
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88



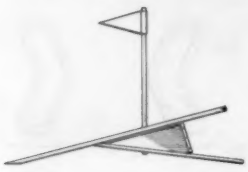
253,418
GAME RACKET
Pete Cosmos, Sr., and John T. Kanne, both of Ashtabula, Ohio, assignors to True Temper Corporation, Cleveland, Ohio
Filed Feb. 23, 1973, Ser. No. 334,990
The portion of the term of this patent subsequent to Nov. 13, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212



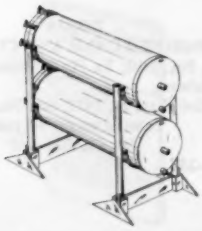
253,419
COMBINED CANE AND CUE STICK
Chin-Tui Kuo, No. 1-10, Ta Ho I Hsiang, Hsi Tun District, Taichung, Taiwan
Filed Mar. 29, 1977, Ser. No. 782,550
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—232

253,420
GOLFER'S TOOL
John G. Heerlien, Cuyahoga County, Ohio, assignor to Unitec Corporation, Cleveland, Ohio
Filed Jul. 8, 1977, Ser. No. 814,149
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

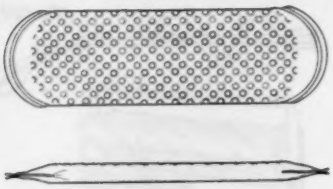
253,421
PUTTING TRAINING DEVICE
Robert E. Gordon, 13222 Admiral Ave., Unit "H", Marina Del Rey, Calif. 90291
Filed Mar. 13, 1978, Ser. No. 886,177
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



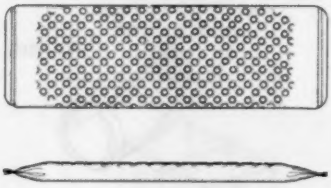
253,422
FILTER FOR CLEANING FLUID OR THE LIKE
Robert G. Smith, St. Louis County, Mo., assignor to Kleen-Rite, Inc., St. Louis, Mo.
Filed Nov. 18, 1977, Ser. No. 852,767
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



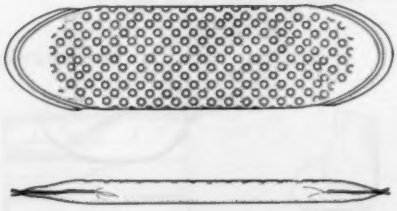
253,423
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,281
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



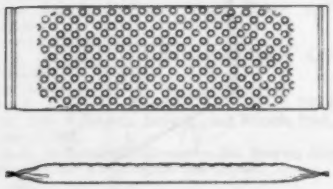
253,424
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,284
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



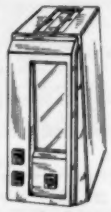
253,425
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,285
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51

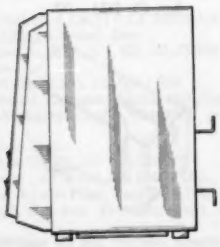


253,426
SANITARY NAPKIN
Robert J. Roeder, Appleton, Wis., assignor to Kimberly-Clark Corporation
Filed Nov. 13, 1978, Ser. No. 960,293
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51

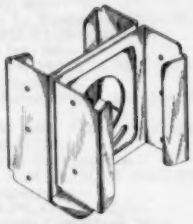


253,427
ELECTRONIC HEMADYNAMOMETER
Yoshihisa Ohie, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 20, 1978, Ser. No. 962,151
Claims priority, application Japan, May 24, 1978, 53-21472
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

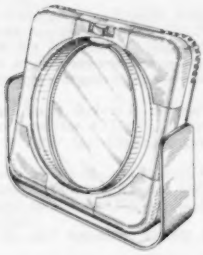




253,428
SAW BUCK BRACKET
William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 12, 1977, Ser. No. 859,285
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D25—68

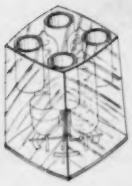


253,429
DOUBLE-SIDED ILLUMINATED MIRROR
Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed May 19, 1978, Ser. No. 907,833
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—67



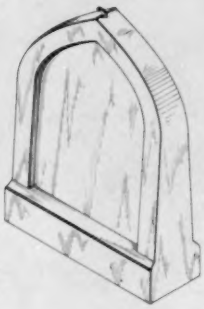
253,430
BILBOQUET STAFF
Matthew E. Morrison, 2455 8th Ave., N., St. Petersburg, Fla. 33713
Filed Jul. 14, 1976, Ser. No. 705,346
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—62

253,431
MULTILAMP FLASHLAMP ARTICLE HAVING COMBUSTIBLE MEMBER THEREIN
Paul M. Marecek, Montoursville, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Sep. 6, 1977, Ser. No. 831,068
Term of patent 14 years
Int. Cl. D26—*04;* D16—*05*
U.S. Cl. D48—33

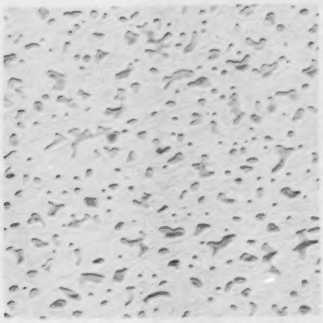


253,432
COMBINED HURRICANE LAMP AND CENTERPIECE OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 10021
Filed Sep. 23, 1977, Ser. No. 835,988
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2

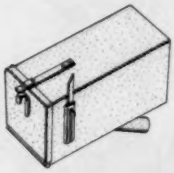
253,433
CANDLE
John H. Schuler, II, R.D. #1, Hanover, Pa. 17331
Filed Feb. 26, 1979, Ser. No. 15,413
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 R



253,434
EMBOSSED PLASTIC SHEET MATERIAL
Emanuel Mittman, Forest Hills, N.Y., and Mark R. Weitzman, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed May 24, 1976, Ser. No. 689,419
Term of patent 14 years
Int. Cl. D05—*06*
U.S. Cl. D92—1.1



253,435
MAILBOX
Stephen D. Hale, Rte. 1, Box 316, Dublin, Va. 24084
Filed Nov. 11, 1977, Ser. No. 850,662
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Westin and Backlund: *See*—
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Blaskowski, Henry J., to Combustion Engineering, Inc. Soot blower for tube bundle in pressurized enclosure. 4,173,808, Cl. 15-316.00R.
Blatter, Albert, to Bendix Corporation, The. Fast response temperature sensor. 4,174,512, Cl. 338-25.000.
Bloomquist, Lynn M. H.; and Brazil, Robert J., to Munsingwear, Inc. Pouch design brief. 4,173,976, Cl. 128-159.000.
Bluy, Orest Z.: *See*—
Merklinger, Harold M.; and Bluy, Orest Z., 4,174,503, Cl. 330-300.000.
Bobard, Emile, to Emile Bobard and Jeune Bobard (S.A.). Self-propelled unit with a high-clearance chassis vehicle. 4,174,012, Cl. 180-313.000.
Boberski, William G.; Chang, Wen-Hsuan; and Seiner, Jerome A., to PPG Industries, Inc. Cementitious magnesia compositions containing salts of organo-silanols. 4,174,228, Cl. 106-107.000.
Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., to PPG Industries, Inc. Magnesium oxide cementitious compositions containing hydrolyzable organo-silicon compounds. 4,174,229, Cl. 106-107.000.
Bode, James D., to Bendix Autolite Corporation. Solid electrolyte oxygen sensor with zero oxygen reference. 4,174,258, Cl. 204-195.00S.
Bodor, Nicolae S.; and Yuan, Sun-Shine, to INTERx Research Corporation. Intermediates useful in the preparation of optically and therapeutically active-m-acyloxy-(methyl-amino) methyl benzyl alcohols. 4,174,450, Cl. 546-16.000.
Boeing Company, The: *See*—
Mohn, Larry W., 4,174,083, Cl. 244-53.00B.
Boerboom, Anne J. H.: *See*—
Tuithof, Hans H.; and Boerboom, Anne J. H., 4,174,479, Cl. 250-292.000.
Bogar, William H.; and Irwin, Howard D., to Du Pont de Nemours, E. I., and Company. Resilient center plane assembly. 4,174,140, Cl. 308-137.000.
Boik, Arnold R., to Continental Group, Inc., The. Necked-in aerosol containers. 4,173,883, Cl. 72-354.000.
Bolen, Ralph A., to Sawyer, John. Device for purging pitot and static line tubes. 4,174,049, Cl. 222-5.000.
Bolex International SA: *See*—
Laurent, Francois, 4,174,153, Cl. 350-184.000.
Boling, Norman L.; and Fein, Michael E., to Owens-Illinois, Inc. Laser cutting of tubular articles. 4,174,476, Cl. 219-121.00L.
Bollman, Edwin, to Sulzer Brothers Limited. Foundation frame for an internal combustion engine and electrical generator set. 4,174,482, Cl. 290-1.00A.
Bopst, John H., III. System for instantaneous sealing of cracked lines in plaster. 4,174,249, Cl. 156-577.000.
Bordenca, Carl, to SCM Corporation. Terpenylaminoalkanol fish toxicants. 4,174,406, Cl. 424-325.000.
Borel, Albert W.; and Baldwin, Bernard A., to Phillips Petroleum Company. Hydrocarbylpolythiobenzoic acids as anti-oxidation additives. 4,174,284, Cl. 252-48.600.
Borer, Werner J.; and Zuzak, Tomas, to Swiss Aluminium Ltd. Process and device for the production of submicron-sized metallic oxides. 4,174,203, Cl. 23-294.00R.
Borg-Warner Corporation: *See*—
Roberts, Richard W., 4,174,191, Cl. 417-222.000.
Bosch, Franz-Ulrich: *See*—
Knapp, Heinrich; Bosch, Franz-Ulrich; and Schnepf, Gunther, 4,174,511, Cl. 337-107.000.
Bottussi, Elvio: *See*—
Novello, Renzo; and Bottussi, Elvio, 4,174,007, Cl. 144-1.00R.
Bourrelly, Jacques: *See*—
Gignier, Jean P.; and Bourrelly, Jacques, 4,174,449, Cl. 546-134.000.
Bousquet, Andre; and Braye, Emile, to Parcor. Process for the preparation of thienopyridine derivatives. 4,174,448, Cl. 546-114.000.
Boyum, Ronald S.: *See*—
Matsuo, Jon T.; and Boyum, Ronald S., 4,174,084, Cl. 244-149.000.
Bradshaw, Norman F., to Schweitzer Industrial Corporation. Paint spray booth with air supply system. 4,173,924, Cl. 98-115.0SB.
Braid, Milton, to Mobil Oil Corporation. Lubricant compositions and ether or ester of 1-hydroxybenzotriazole as antioxidant in the compositions. 4,174,285, Cl. 252-51.50A.
Brandl, Ronald A.: *See*—
Valdespino, Joseph M.; and Brandl, Ronald A., 4,174,094, Cl. 254-86.00H.
Bravin, Robert V.: *See*—
Lundin, Alyce; and Bravin, Robert V., 4,173,795, Cl. 2-425.000.
Braye, Emile: *See*—
Bousquet, Andre; and Braye, Emile, 4,174,448, Cl. 546-114.000.
Brazil, Robert J.: *See*—
Bloomquist, Lynn M. H.; and Brazil, Robert J., 4,173,976, Cl. 128-159.000.
Breco Kunststoffverarbeitungs-GmbH & Co. KG: *See*—
Breher, Rudolf, 4,174,367, Cl. 264-261.000.
Breher, Rudolf, to Breco Kunststoffverarbeitungs-GmbH & Co. KG. Form tool for production of a reinforced hose piece. 4,174,367, Cl. 264-261.000.
Brenneman, Allen, to Aktiebolaget Electrolux. Safety switch for floor treatment apparatus. 4,174,473, Cl. 200-157.000.
Brenner, Wolfgang: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Brenner, Wolfgang A. A.: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.
Bresnyan, Nicholas P. Apparatus for flushing toilets. 4,173,801, Cl. 4-326.000.
Briem, Karl: *See*—
Kienow, Sigismund; and Briem, Karl, 4,174,089, Cl. 249-80.000.
Brignall, Clifford N. Tortilla pie shell holder. 4,173,926, Cl. 99-349.000.
British Gas Corporation: *See*—
Archbold, Thomas; and Sharp, Michael R. G., 4,173,886, Cl. 73-23.000.
Brockhaus, Anton, to Westfalia-Werke Franz Knobel & Sohne KG. Fastening device for a fixable covering. 4,174,133, Cl. 296-26.000.
Broger, Lars I.; and Magnusson, Sten E., to Telefonaktiebolaget L M Ericsson. Multi-party telephone system allowing speech connection between extensions as between extensions and an outer line. 4,174,466, Cl. 179-18.0AD.
Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Thiobis(oxazolines). 4,174,322, Cl. 548-237.000.
Brooks, Robert B., to General Electric Company. Refrigeration apparatus demand defrost control system and method. 4,173,871, Cl. 62-80.000.
Brooks, Robert J., to Interface Mechanisms, Inc. Tape tensioning apparatus particularly useful in printing apparatus. 4,174,078, Cl. 242-75.430.
Brown, Boveri & Cie Aktiengesellschaft: *See*—
Depenbrock, Manfred, 4,174,497, Cl. 323-119.000.
Brown, James B. Self contained antiseptic applicator swab. 4,173,978, Cl. 128-269.000.
Brown, Rex M. Draft air control for fireplace grate. 4,173,967, Cl. 126-143.000.
Bruckert, Walter, to Union Carbide Corporation. Vapor-liquid contacting tray with vapor thrust means. 4,174,363, Cl. 261-114.0TC.
Brun, Andre G., to Compagnie Francaise des Petroles. Process and apparatus for transfer of cargo at sea. 4,174,188, Cl. 414-139.000.

Bruzzese, Tiberio, to Holco Investment Inc. Process for the preparation of rifampicin. 4,174,320, Cl. 260-239.30P.

BUCK Chemisch-Technische Werke GmbH. & Co., Firma: *See*—
Schiessl, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, 4,173,931, Cl. 102-90.000.

Buck, Kenneth J.: *See*—
Hamaker, Ralph A.; and Buck, Kenneth J., 4,174,171, Cl. 355-3.0BE.

Buckner, John G.: *See*—
Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., 4,173,910, Cl. 83-29.000.
Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W., 4,173,911, Cl. 83-29.000.

Buczek, Carl J.: *See*—
Chenausky, Peter P.; Buczek, Carl J.; and Wayne, Robert J., 4,174,504, Cl. 331-94.50Q.

Bujnowski, Edward J.: *See*—
Lau, George W.; and Bujnowski, Edward J., 4,174,070, Cl. 239-340.000.
Lau, George W.; and Bujnowski, Edward J., 4,174,071, Cl. 239-348.000.

Bulen Chemical Company Midwest, Inc.: *See*—
Flanagan, John J., 4,174,304, Cl. 252-524.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-inter-oxa-13,14-didehydro-16-phenyl-17,18,19,20-tetranor-PGF_1 compounds. 4,174,456, Cl. 560-60.000.

Burg, Karlheinz: *See*—
Luders, Walter; Herwig, Walter; van Spankeren, Ulrich; and Burg, Karlheinz, 4,174,340, Cl. 260-42.140.

Burns, Henry L., to Cavitron Corporation. Aerosol interface. 4,173,977, Cl. 128-201.000.

Burns, Michael E.; and Nicol, Charles H., to Procter & Gamble Company, The. Alkyl benzene sulfonate detergent compositions containing cellulose ether soil release agents. 4,174,305, Cl. 252-545.000.

Burrell, Dean W. Snow removal tool. 4,173,835, Cl. 37-53.000.

Burroughs Corporation: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,174,537, Cl. 364-200.000.

Burzio, Fulvio: *See*—
Gafa, Salvatore; and Burzio, Fulvio, 4,174,306, Cl. 252-546.000.

Butcher, Daryl T.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Butterworth, Donald J., to Ecodyne Corporation. Liquid treatment apparatus. 4,174,282, Cl. 210-/232.000.

Byrt, Graham A. B.; and Riddler, Douglas E., to Masson Scott Thrissell Engineering, Ltd. Change-speed gearboxes. 4,173,905, Cl. 74-356.000.

C. Itoh & Co. Ltd.: *See*—
Takama, Teruhiro, 4,173,896, Cl. 73-518.000.

Calvin, John N., to Combustion Engineering, Inc. Hydraulic hold-down for nuclear reactor fuel. 4,174,257, Cl. 176-50.000.

Campbell, David L., to Miller, Richard G.; Little, Clifton W.; Yovan, Alex; Gause, Charles M.; Campbell, Don Harvey; McManus, Sam P.; Weiler, David L.; Cox, Clodis H.; Weiler, Mable E.; and Weiler, Richard T. Fence. 4,174,096, Cl. 256-24.000.

Campbell, Don Harvey: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Campbell, James F.: *See*—
Steiner, Gary F.; and Campbell, James F., 4,173,846, Cl. 51-248.000.

Canada, Her Majesty the Queen in right of: *See*—
Merklinger, Harold M.; and Bluy, Orest Z., 4,174,503, Cl. 330-300.000.

Canadian Patents & Development Limited: *See*—
Westby, Ray L., 4,174,520, Cl. 343-13.00R.

Canon Kabushiki Kaisha: *See*—
Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 4,174,215, Cl. 430-68.000.
Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, 4,174,161, Cl. 354-33.000.

Capdevielle, Martin J.: *See*—
Kulischenko, Walter; and Capdevielle, Martin J., 4,173,937, Cl. 114-144.00R.

Caporiccio, Gerardo: *See*—
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.

Capra, Nicholas G.; and Hammett, Roy, to James D. Pauls, Ltd. Mechanically operated dispensing device with expansible bulb. 4,174,052, Cl. 222-207.000.

Capra, Nicholas G.; and Antenore, Ronald L., to James D. Pauls & J. Claybrook Lewis & Associates, Ltd. Non-aerosol pressure dispenser. 4,174,055, Cl. 222-319.000.

Carborundum Company, The: *See*—
Myles, Thomas A., 4,174,331, Cl. 260-29.10R.

Carlin, William W.; and Dahlberg, Lois A., to PPG Industries, Inc. Method of treating electrodes. 4,174,269, Cl. 204-129.950.

Carn, William R.; and Carothers, James L., to Chicago Bridge & Iron Company. Multiport piggable fluid swivel. 4,174,127, Cl. 285-190.000.

Carniselli, Giuliano: *See*—
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.

Carothers, James L.: *See*—
Carn, William R.; and Carothers, James L., 4,174,127, Cl. 285-190.000.

Carrens, Donald E., to Dresser Industries, Inc. Seal assembly. 4,174,112, Cl. 277-171.000.

Carrier Corporation: *See*—
Jahoda, John, 4,173,998, Cl. 165-182.000.

Carroll, James C.; and Shafer, Clel H., to Phillips Petroleum Company. Process and apparatus for connecting plastic pipes. 4,174,248, Cl. 156-538.000.

Cartes, Juan Bosch: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.

Cassia, Antonio M., to Steiner Corporation. Soap dispensing system. 4,173,858, Cl. 53-471.000.

Castagna, John F., to Sparkomatic Corporation. Response tracer audio equalizer amplifier unit having graphic response display. 4,173,941, Cl. 116-307.000.

Caterpillar Tractor Co.: *See*—
Styck, Wayne G., 4,174,128, Cl. 292-127.000.

Cavitron Corporation: *See*—
Burns, Henry L., 4,173,977, Cl. 128-201.000.

Cecere, Andrew P., to Samcoe Holding Corporation. Apparatus for calendering tubular knitted fabrics. 4,173,812, Cl. 26-84.000.

Cerroni, Manlio. Apparatus for processing waste material chiefly composed of paper and plastic film. 4,174,075, Cl. 241-189.00R.

Challis, Louis A. Acoustic treatment for fans. 4,174,020, Cl. 181-211.000.

Chamberlin, James W.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,174,454, Cl. 548-306.000.

Chambley, Phillip W.: *See*—
Norris, Alan H.; and Chambley, Phillip W., 4,173,861, Cl. 57-293.000.

Chan, David C. K.: *See*—
Schinski, William L.; Huang, Irene C.; and Chan, David C. K., 4,174,210, Cl. 71-118.000.

Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, to International Business Machines Corporation. Two-dimensional bubble domain memory. 4,174,538, Cl. 365-2.000.

Chang, Hsu: *See*—
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, 4,174,538, Cl. 365-2.000.

Chang, Wen-Hsuan: *See*—
Boberski, William G.; Chang, Wen-Hsuan; and Seiner, Jerome A., 4,174,228, Cl. 106-107.000.
Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.

Chapman, Charles C., to Phillips Petroleum Company. Alkylation process. 4,174,357, Cl. 585-701.000.

Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., to May & Baker Limited. Spiramycin esters. 4,174,391, Cl. 424-180.000.

Charles, Richard J., to Paper Converting Machine Company. Core holder for reeling. 4,174,077, Cl. 242-68.600.

Charnley, Ralph L.: *See*—
Melander, Theodore A.; and Charnley, Ralph L., 4,174,169, Cl. 354-324.000.

Chase, Frank R., to Donaldson Company, Inc. Pulse jet cleaned air filter assembly with integral air compressor. 4,174,204, Cl. 55-283.000.

Chastagnier, Jean; and Massip, Jean C., to U.S. Philips Corporation. Command signal generator for an automatic channel selection device in a radio which is mobile relative to transmitter stations. 4,174,501, Cl. 325-56.000.

Chen, Lim B.; and Cher, Lim L. Educational toy. 4,173,832, Cl. 35-9.00B.

Chenausky, Peter P.; Buczek, Carl J.; and Wayne, Robert J., to United Technologies Corporation. Apparatus and method for cavity dumping a Q-switched laser. 4,174,504, Cl. 331-94.50Q.

Cher, Lim L.: *See*—
Chen, Lim B.; and Cher, Lim L., 4,173,832, Cl. 35-9.00B.

Chevron Research Company: *See*—
Schinski, William L.; Huang, Irene C.; and Chan, David C. K., 4,174,210, Cl. 71-118.000.
Schneider, Ronald A., 4,174,366, Cl. 264-228.000.

Chiba, Katuaki: *See*—
Nakamura, Satoshi; Ikushima, Ichiro; Sasaki, Yoshimitsu; Chiba, Katuaki; and Ito, Ryoichi, 4,174,491, Cl. 313-499.000.

Chicago Bridge & Iron Company: *See*—
Carn, William R.; and Carothers, James L., 4,174,127, Cl. 285-190.000.

Chipman, Donald I., to General Electric Company. Hydraulic jack. 4,174,095, Cl. 254-93.00H.

Chiu, Herman S., to Union Carbide Corporation. Curved sausage casings. 4,174,368, Cl. 264-561.000.

Chloride Group Limited: *See*—
Ramsbottom, Edgar; Whalley, William; and Bale, Edmund, 4,174,004, Cl. 141-32.000.

Choca, Monica E.; and Feistel, Gerald R., to Nalco Chemical Company. Polycarboxylic acids as extrusion aids for silica-aluminas. 4,174,301, Cl. 252-455.00R.

Chow, Kirk K., to National Hand Tool Corporation. Space-conserving skin-packed assembly. 4,174,037, Cl. 206-378.000.

Chrenko, Richard M.: *See*—
Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., 4,174,380, Cl. 423-446.000.

Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. 4-Iodomethylazetidin-2-one. 4,174,316, Cl. 260-239.00A.

Chu, Ke-Chiang; and Sharp, Richard S., to Burroughs Corporation. Time-shared, multi-phase memory accessing system having automatically updatable error logging means. 4,174,537, Cl. 364-200.000.

Chugoku Marine Paints Ltd.: *See*—
Matsuda, Sumio; and Kudara, Hajime, 4,174,339, Cl. 260-40.00R.

Ciba-Geigy Corporation: *See*—
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,174,326, Cl. 260-326.00E.
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,174,455, Cl. 560-49.000.
Loeffler, Herbert H., 4,174,056, Cl. 222-321.000.

Cima Kogaku Company Limited: *See*—
Nagashima, Motoi, 4,174,167, Cl. 354-196.000.

Citizen Watch Company Limited: *See*—
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Clark, Norman O.; and Jones, Thomas R., to English Clays Lovering Pochin & Co. Ltd. Mineral fillers. 4,174,279, Cl. 210-54.000.

Clausing, Don P., to Xerox Corporation. Sheet separating and feeding apparatus. 4,174,102, Cl. 271-35.000.

Clayton Dewandre Company Limited: *See*—
Levington, Henry J.; and Knowles, James G., 4,174,016, Cl. 180-89.150.

Clayton, John M., Jr.: *See*—
Stockinger, John, 4,173,813, Cl. 29-266.000.

Clayton, John M., III: *See*—
Stockinger, John, 4,173,813, Cl. 29-266.000.

Cleary, Mark R., to Jubilee Manufacturing Co. Alarm device. 4,174,516, Cl. 340-63.000.

Cleveland, John H.; and Bentley, Brent A. Lid lifter for reclosable self-sealing buckets. 4,173,909, Cl. 81-3.360.

CMI Corporation: *See*—
Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., 4,174,181, Cl. 366-2.000.

Coe, Noel N.: *See*—
Saeman, Walter C.; Coe, Noel N.; and Faust, John P., 4,174,411, Cl. 427-214.000.

Cohen, Abraham B.; and Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Process for image reproduction using multilayer photosensitive tonable element. 4,174,216, Cl. 430-257.000.

Cohen, Mitchell S.; and Pugh, Emerson W., to International Business Machines Corporation. Bubble domain transfer switches. 4,174,540, Cl. 365-15.000.

Colgate-Palmolive Company: *See*—
Cordon, Martin; and Dickson, Robert E., 4,174,387, Cl. 424-52.000.

Colin, Armand T., to Constructions Metalliques de Provence. Anchors and anchoring system. 4,173,938, Cl. 114-301.000.

Collins, John D.; and Wood, Donald A., to Albright & Wilson Limited. Process for preparing organotin compounds. 4,174,346, Cl. 260-429.700.

Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., to United States of America, Energy. Process for disposal of aqueous solutions containing radioactive isotopes. 4,174,293, Cl. 252-301.10W.

Combe, Edward C.: *See*—
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.

Combustion Engineering, Inc.: *See*—
Blaskowski, Henry J., 4,173,808, Cl. 15-316.00R.
Calvin, John N., 4,174,257, Cl. 176-50.000.
Gaines, Albert L., 4,174,254, Cl. 176-2.000.
Waryasz, Richard E., 4,173,950, Cl. 122-4.00D.

Commissariat a l'Energie Atomique: *See*—
Perdijon, Jean, 4,173,899, Cl. 73-620.000.

Compagnie des Lampes, Societe Anonyme: *See*—
Barthes, Emile; and Richard, Jean-Luc, 4,174,533, Cl. 362-346.000.

Compagnie Francaise des Petroles: *See*—
Brun, Andre G., 4,174,188, Cl. 414-139.000.

Compagnie Generale des Etablissements Michelin: *See*—
Lejeune, Daniel, 4,173,992, Cl. 152-381.100.

Congleton, Robert S., to Jersey Nuclear-Avco Isotopes, Inc. System for combining laser beams of diverse frequencies. 4,174,150, Cl. 350-174.000.

Constructions Metalliques de Provence: *See*—
Colin, Armand T., 4,173,938, Cl. 114-301.000.

Container Corporation of America: *See*—
Turner, Gerald W., 4,174,041, Cl. 206-611.000.

Continental Group, Inc., The: *See*—
Boik, Arnold R., 4,173,883, Cl. 72-354.000.
Edwards, Edgar B.; and Wachter, Richard G., 4,174,051, Cl. 222-105.000.
Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., 4,174,142, Cl. 339-5.00R.

Control Data Corporation: *See*—
Timm, Walter C., 4,174,539, Cl. 365-8.000.

Cope, Louise A. Ophthalmic use of collagenase. 4,174,389, Cl. 424-94.000.

Copeland Corporation: *See*—
Elson, John P., 4,174,189, Cl. 417-363.000.

Cordon, Martin; and Dickson, Robert E., to Colgate-Palmolive Company. Reduction of abrasiveness in dentifrices. 4,174,387, Cl. 424-52.000.

Corsaut, William J.: *See*—
Ayers, Myron T.; and Corsaut, William J., 4,174,242, Cl. 156-110.00R.

Cosden Technology, Inc.: *See*—
Mayes, Warden W., 4,174,270, Cl. 208-64.000.
Mayes, Warden W., 4,174,271, Cl. 208-64.000.

Couling, Sidney L.: *See*—
Bennett, Foster C.; and Couling, Sidney L., 4,174,214, Cl. 75-168.00R.

Cox, Clodis H.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Craig, Edwin R.; and Semken, Robert S., to United States of America, Energy. Annular linear induction pump with an externally supported duct. 4,174,190, Cl. 417-50.000.

Crook, Edward J., Jr., to American Hoist & Derrick Company. Multiple position hook assembly. 4,174,132, Cl. 294-83.00R.

Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, to Spie-Batignolles; and Societe Generale de Techniques et d'Etudes. Separating exchangers. 4,174,273, Cl. 208-364.000.

Crouzet: *See*—
Forster, Michel; and Rampin, Pierre, 4,173,889, Cl. 73-194.00A.

Curran, Roger, to Bangor Punta Operations, Inc. Safety for the trigger mechanism of a gun. 4,173,964, Cl. 124-40.000.

Curtin, Brian J. Corneal resurfacing apparatus and method. 4,173,980, Cl. 128-303.00R.

Custom Research and Development: *See*—
Leveskis, Newton G., 4,174,290, Cl. 252-142.000.

Cutler-Hammer, Inc.: *See*—
Hicks, Loy A., Jr.; and Rusenko, James J., 4,174,143, Cl. 339-22.00B.
Josemans, Leonardus J., 4,174,472, Cl. 200-68.000.

Daddario, Francis E. Tide operated pumps. 4,174,192, Cl. 417-333.000.

Dahlberg, Lois A.: *See*—
Carlin, William W.; and Dahlberg, Lois A., 4,174,269, Cl. 204-129.950.

Daigo, Kunihiro: *See*—
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Daitoku, Kouichi; and Takahata, Kouichi, deceased (by Takahata, Kosaku, legal successor), to Nippon Kogaku K.K. Motor drive device for long-footage film. 4,174,166, Cl. 354-173.000.

Dalton, Philip B., to GAF Corporation. Aza-bis-lactams. 4,174,443, Cl. 544-86.000.

Danna, Gary F.: *See*—
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Dart Industries Inc.: *See*—
Elias, Moenes L.; and Readio, Philip D., 4,174,253, Cl. 156-666.000.

Davin, Andre: *See*—
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,174,313, Cl. 260-123.500.

Davis, Pauls; Gahmig, Herbert H.; and Schmolka, Irving R., to BASF Wyandotte Corporation. Method of making expandable polystyrene beads. 4,174,427, Cl. 521-56.000.

Dechering, Johannes A. B.; and Geurts, Martinus F. A. M., to U.S. Philips Corporation. Television camera having low-frequency noise correction. 4,174,525, Cl. 358-217.000.

Dell, Christopher C., to National Research Development Corporation. Countercurrent decantation. 4,174,281, Cl. 210-83.000.

Della-Porta, Clifford A., to Premier Drum Company Limited, The. Musical drums. 4,173,917, Cl. 84-419.000.

DeLong, Daniel L.; and Rich, Edward L., III, to Westinghouse Electric Corp. Magnetic means for determining partial pressure of oxygen particularly in underwater breathing apparatus. 4,173,975, Cl. 128-142.00R.

Del Porto, David A.: *See*—
Bell, William M.; and Del Porto, David A., 4,174,371, Cl. 422-109.000.

Delta Systems, Inc.: *See*—
Howard, William A., 4,173,961, Cl. 123-148.00E.

DeMarco, Thomas M.: *See*—
Dupre, George T.; and DeMarco, Thomas M., 4,174,206, Cl. 55-434.000.

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Nakano, Tatsuo; Hori, Shozo; and Kishi, Ikuji, 4,174,311, Cl. 260-28.50R.

den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., to Stamicarbon, B.V. Process for preparing cyanuric acid. 4,174,444, Cl. 544-192.000.

Depenbrock, Manfred, to Brown, Boveri & Cie Aktiengesellschaft. Circuit and method for controlling reactive load currents of a three-phase system. 4,174,497, Cl. 323-119.000.

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Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Deschamps, Andre; Dezael, Claude; Gruhier, Henri; and Renault, Philippe, to Institut Francais du Petrole. Process for purifying a sulfur dioxide containing gas with production of elemental sulfur. 4,174,383, Cl. 423-573.00R.

Desorbay, Jean-Pierre: *See*—
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

Dezael, Claude: *See*—
Deschamps, Andre; Dezael, Claude; Gruhier, Henri; and Renault, Philippe, 4,174,383, Cl. 423-573.00R.
Diamond International Corporation: *See*—
Grogan, Richard P., 4,174,069, Cl. 239-333.000.
McCord, Robert C., 4,173,831, Cl. 34-236.000.
Dickson, Robert E.: *See*—
Cordon, Martin; and Dickson, Robert E., 4,174,387, Cl. 424-52.000.
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., to Bayer Aktiengesellschaft. Compounds containing hydroxyl groups and urethano-aryl-sulfonic acid groups. 4,174,434, Cl. 528-69.000.
Digital Communications Corporation: *See*—
Querry, Lester R., 4,174,505, Cl. 332-9.00R.
DiMaria, James D. Copy preview apparatus. 4,174,175, Cl. 355-44.000.
DiSanto, Rocco J. Forming insulation from scrap rubber. 4,174,308, Cl. 260-2.300.
Dobbert, Gerd; and Reh, Klaus, to International Standard Electric Corporation. Vertical deflection circuit. 4,174,493, Cl. 315-408.000.
Dobinson, Reginald P. Forming machine for bending metal bars. 4,173,884, Cl. 72-387.000.
Dockree, Basil F., to Pipeline Seal and Insulation Co. Ltd. Pipe joints and connectors therefor. 4,174,124, Cl. 285-54.000.
Dr. Boy K.G.: *See*—
Spanier, Hermann, 4,174,474, Cl. 200-331.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Schaefer, Klaus, 4,174,527, Cl. 358-267.000.
Documation Incorporated: *See*—
Fisher, Gary P., 4,173,929, Cl. 101-336.000.
Doerre, Wolfgang: *See*—
Schaefer, Peter; and Doerre, Wolfgang, 4,174,088, Cl. 248-395.000.
Domingo, Mercedes Alvarez: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.
Donahue, William R., Jr.; and Swanson, Wesley S., to Eaton Corporation. Drain valve. 4,174,091, Cl. 251-138.000.
Donaldson Company, Inc.: *See*—
Chase, Frank R., 4,174,204, Cl. 55-283.000.
Dooley, Stephen J. Stairlift. 4,174,023, Cl. 187-12.000.
Dornier Systems GmbH: *See*—
Schmidberger, Rainer, 4,174,260, Cl. 204-260.000.
Dougherty, Timothy S.; and Flegal, William M., to Western Electric Company, Inc. Methods of and apparatus for controlling capacitance unbalance-to-ground in cables. 4,174,236, Cl. 156-51.000.
Dow Chemical Company, The: *See*—
Fisher, Thomas H.; and Dowd, William, 4,174,352, Cl. 260-599.000.
Griffin, Thomas J., Jr., 4,174,283, Cl. 252-8.55R.
Mixan, Craig E., 4,174,394, Cl. 424-250.000.
Simpson, Benny E., 4,174,202, Cl. 23-230.00R.
Dowd, William: *See*—
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Dresser Industries, Inc.: *See*—
Carrens, Donald E., 4,174,112, Cl. 277-171.000.
Eckman, Richard E., 4,174,113, Cl. 279-19.400.
Drillick, Jacob H., to Drillick-LaManna Corporation. Paper tape punch and reader. 4,174,063, Cl. 234-130.000.
Drillick-LaManna Corporation: *See*—
Drillick, Jacob H., 4,174,063, Cl. 234-130.000.
Duc, Xuong N., to Institut Francais du Petrole. Floating installation connected to a stationary underwater installation through at least one flexible pipe. 4,173,804, Cl. 9-8.00P.
Dugasz, William L. Corrosion resistant self-aligning track configurations particularly adapted for railroad cars. 4,174,066, Cl. 238-7.000.
Duphar International Research B.V.: *See*—
Van Daalen, Jan J.; and Mulder, Rudolf, 4,174,393, Cl. 424-250.000.
Du Pont de Nemours, E. I., and Company: *See*—
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,174,420, Cl. 428-310.000.
Bogar, William H.; and Irwin, Howard D., 4,174,140, Cl. 308-137.000.
Cohen, Abraham B.; and Fan, Roxy N., 4,174,216, Cl. 430-257.000.
Epstein, Bennett N., 4,174,358, Cl. 525-183.000.
Reeves, James W.; Sylvester, Robert W.; and Wells, David F., 4,174,381, Cl. 423-502.000.
Tomic, Ernst A., 4,174,227, Cl. 106-85.000.
Dupre, George T.; and DeMarco, Thomas M., to NFE International Ltd. Apparatus for separating particulate material from an airstream. 4,174,206, Cl. 55-434.000.
Dupro AG: *See*—
Maier, Siegfried, 4,173,807, Cl. 15-179.000.
Durand, David, to Freeman Transfer Printing Company, Inc. Apparatus for sublimation imprinting tiles. 4,174,250, Cl. 156-583.300.
Dyck, Arthur, to International Audio Visual, Inc. Apparatus for splicing the ends of magnetic tape wound on spools of the type used in endless tape cartridges. 4,174,247, Cl. 156-506.000.
E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John; and Turk, Chester F., 4,174,317, Cl. 260-239.00A.
Wade, Peter C.; and Kissick, Thomas P., 4,174,442, Cl. 544-62.000.
Eastman Kodak Company: *See*—
Wang, Richard H. S.; and Zannucci, Joseph S., 4,174,321, Cl. 548-219.000.
Eaton Corporation: *See*—
Donahue, William R., Jr.; and Swanson, Wesley S., 4,174,091, Cl. 251-138.000.
Eckman, Richard E., to Dresser Industries, Inc. Bit retainer for pneumatic tools. 4,174,113, Cl. 279-19.400.
Ecodyne Corporation: *See*—
Butterworth, Donald J., 4,174,282, Cl. 210-/232.000.
Edwards, Edgar B.; and Wachter, Richard G., to Continental Group, Inc., The. Protective locking flaps for opening in sealed corrugated containers. 4,174,051, Cl. 222-105.000.
Eibeck, Richard E.: *See*—
Evans, Francis E.; Berenbaum, Morris B.; Eibeck, Richard E.; and Robinson, Martin A., 4,174,349, Cl. 260-544.00F.
Electronique Marcel Dassault: *See*—
Poli, Pierre R., 4,174,519, Cl. 343-6.50R.
Eli Lilly and Company: *See*—
Hamill, Robert L.; and Stark, W. Max, 4,174,390, Cl. 424-117.000.
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,174,454, Cl. 548-306.000.
Taylor, Harold M.; and Suhr, Robert G., 4,174,209, Cl. 71-94.000.
Elias, Moenes L.; and Readio, Philip D., to Dart Industries Inc. Dissolution of metals utilizing a H_2O_2-H_2SO_4 solution catalyzed with hydroxy substituted cycloparaffins. 4,174,253, Cl. 156-666.000.
Ellis, Jerry Michael: *See*—
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Ellis, Larry E.: *See*—
Baker, Ralph C.; Ellis, Larry E.; and Simpson, Francis M., Jr., 4,174,098, Cl. 267-8.00R.
Ellis, Malcolm P., to Lockwood Corporation. Fan housing clean out apparatus. 4,174,001, Cl. 171-17.000.
Elsasser, Heinrich: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Elsasser, Heinrich K.: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.
Elson, John P., to Copeland Corporation. Refrigeration compressor suspension system. 4,174,189, Cl. 417-363.000.
Emery, John A., to Sinclair International Bar Services Limited. Liquid measuring and dispensing devices. 4,174,057, Cl. 222-332.000.
Emile Bobard and Jeune Bobard (S.A.): *See*—
Bobard, Emile, 4,174,012, Cl. 180-313.000.
Endo Laboratories, Inc.: *See*—
Berger, Joel G., 4,174,453, Cl. 546-85.000.
Energy Utilization Systems, Inc.: *See*—
Amthor, Franklin R., Jr., 4,173,872, Cl. 62-238.000.
English Clays Lovering Pochin & Co. Ltd.: *See*—
Clark, Norman O.; and Jones, Thomas R., 4,174,279, Cl. 210-54.000.
Enicks, James H. Pad member method of manufacture. 4,173,814, Cl. 29-417.000.
Environmental Research Institute of Michigan: *See*—
Sternberg, Stanley R., 4,174,514, Cl. 340-146.3MA.
Envirotech Corporation: *See*—
Rahman, Michael, 4,174,362, Cl. 261-90.000.
Epstein, Bennett N., to Du Pont de Nemours, E. I., and Company. Tough thermoplastic nylon compositions. 4,174,358, Cl. 525-183.000.
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Birkmeyer, William J.; Erikson, J. Alden; and Lewarchik, Ronald J., 4,174,337, Cl. 260-31.40R.
Ernst Leitz Wetzlar GmbH: *See*—
Kraft, Winfried; Reinheimer, Gunter; and Leiter, Herbert, 4,174,159, Cl. 354-23.00R.
Eshoo, Frederick. Solar powered hot air balloon. 4,174,082, Cl. 244-31.000.
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., to U.S. Philips Corporation. Method of and device for arc welding. 4,174,477, Cl. 219-121.00P.
Estess, John H., to Rockwell International Corporation. Adjustable fence. 4,174,100, Cl. 269-306.000.
Etablissements Carpano & Pons: *See*—
Pfeffer, Paul, 4,174,494, Cl. 318-54.000.
Euler, Reinhold: *See*—
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Evans, Francis E.; Berenbaum, Morris B.; Eibeck, Richard E.; and Robinson, Martin A., to Allied Chemical Corporation. Preparation of fluoroorganic compounds with calcium fluoride. 4,174,349, Cl. 260-544.00F.
Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul, 4,173,852, Cl. 51-355.000.
Voglrieder, Leonhard; and Hempel, Raymond O., Jr., 4,173,817, Cl. 29-568.000.
Exxon Research & Engineering Co.: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,174,322, Cl. 548-237.000.
F. L. Smithe Machine Company, Inc.: *See*—
Helm, Herbert W., 4,173,922, Cl. 93-63.00M.
Fahrendorf, Curtis H.; and Berckhan, Delmar D., to Tonka Corporation. Turret toy vehicle. 4,173,840, Cl. 46-202.000.
Fair, Rickey F. Gun locking device. 4,174,042, Cl. 211-8.000.
Faires, C. Dickson, Jr. Dimpled shotgun pellets. 4,173,930, Cl. 102-42.00R.
Fan, Roxy N.: *See*—
Cohen, Abraham B.; and Fan, Roxy N., 4,174,216, Cl. 430-257.000.
Fanelli, Anthony J.: *See*—
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Farcinade, Michel. Restraint severing device. 4,174,015, Cl. 180-268.000.
Farr, Glyn P. R., to Girling Limited. Hydraulic systems. 4,173,866, Cl. 60-413.000.
Faust, John P.: *See*—
Saeman, Walter C.; Coe, Noel N.; and Faust, John P., 4,174,411, Cl. 427-214.000.
Fealk, Sheldon A.: *See*—
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Boling, Norman L.; and Fein, Michael E., 4,174,476, Cl. 219-121.00L.
Feistel, Gerald R.: *See*—
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Ferns, Derek, to Self-Level Covers Aktiengesellschaft. Support frame. 4,174,183, Cl. 404-26.000.
Ferreira, Richard A.; and Vincent, Albert. Collapsible trash bag holder. 4,174,085, Cl. 248-97.000.
Ferrieu, Gilbert M. M., to U.S. Philips Corporation. Ringing signal generator for use in a subscriber's line circuit. 4,174,467, Cl. 179-18.0HB.
Ferris, Donald L., to United States of America, Army. Control rod roll-over limiter. 4,174,137, Cl. 308-72.000.
Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Apparatus including a meter for indicating the fuel consumption rate of an internal combustion engine. 4,173,887, Cl. 73-114.000.
Fiedler, Howard C., to General Electric Company. Product and method of producing silicon-iron sheet material employing antimony. 4,174,235, Cl. 148-111.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Process for dimerization, arylation and trifluoromethylation of aromatic and heterocyclic compounds. 4,174,447, Cl. 546-109.000.
Filak, Paul T.: *See*—
Obuch, Edward A.; and Filak, Paul T., 4,174,148, Cl. 339-246.000.
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Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.
Findeisen, Kurt: *See*—
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,174,433, Cl. 528-49.000.
Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, 4,174,435, Cl. 528-70.000.
Firestone Tire & Rubber Company, The: *See*—
Halasa, Adel F.; Hall, James E.; and Schulz, Donald N., 4,174,431, Cl. 526-173.000.
Firmenich SA: *See*—
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,174,327, Cl. 260-346.110.
Fischer, Adolf, deceased (by Fischer, Caecilia E., heiress), to BASF Aktiengesellschaft. Herbicidal compositions. 4,174,208, Cl. 71-92.000.
Fischer, Caecilia E., heiress: *See*—
Fischer, Adolf, deceased, 4,174,208, Cl. 71-92.000.
Fisher, Gary P., to Documation Incorporated. Printer ribbon anti-fold mechanism. 4,173,929, Cl. 101-336.000.
Fisher, Thomas H.; and Dowd, William, to Dow Chemical Company, The. Process for aqueous chromate ion oxidation of allylic halides and halomethylated aromatics to allylic and aromatic aldehydes. 4,174,352, Cl. 260-599.000.
Fishgal, Semyon I., to International Design and Development Corporation. Method of improving the working properties of liquid systems. 4,173,983, Cl. 137-13.000.
Fitzpatrick, Paul, to Ex-Cell-O Corporation. Expandable tool including cutting section and pilot. 4,173,852, Cl. 51-355.000.
Fitzpatrick, Thomas H.; Williamson, James E., Jr.; and Alexanderson, Walter H., to Babcock & Wilcox Company, The. Refractory mix composition and method of preparation. 4,174,226, Cl. 106-64.000.
Flanagan, John J., to Bullen Chemical Company Midwest, Inc. Surfactant system. 4,174,304, Cl. 252-524.000.
Flatley, Doris W., to RCA Corporation. Method for making semiconductor structure. 4,174,217, Cl. 96-36.200.
Flegal, William M.: *See*—
Dougherty, Timothy S.; and Flegal, William M., 4,174,236, Cl. 156-51.000.
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., to Josam Manufacturing Co. Low-profile syphon trap. 4,173,800, Cl. 4-207.000.
FMC Corporation: *See*—
Milberger, Lionel J., 4,174,000, Cl. 166-362.000.
Fontanelli, Renzo: *See*—
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.
Ford Motor Company: *See*—
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Ford, Richard D.; and Vitkovitsky, Ihor M., to United States of America, Navy. Explosively actuated opening switch. 4,174,471, Cl. 200-61.080.
Forster, Michel; and Rampin, Pierre, to Crouzet. Ultrasonic flowmeter. 4,173,889, Cl. 73-194.00A.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, to Mannesmann Aktiengesellschaft. Method of adjusting ultrasonic test systems. 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, to Mannesmann Aktiengesellschaft. System for nondestructive, ultrasonic testing of test objects. 4,173,898, Cl. 73-611.000.
Foster Wheeler Energy Corporation: *See*—
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Fowler, William P., to Weatherford/Lamb Inc. Pneumatically actuated thread protector for pipes. 4,173,988, Cl. 138-96.00T.
Fowles, Thomas A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Hermetically sealed tamperproof port protector and method of making frangible seal. 4,174,238, Cl. 156-69.000.
Francis, Lawrence E. Welding rod holder accessory. 4,174,062, Cl. 228-19.000.
Frankhuizen, Michiel, to Xerox Corporation. Recording disk cartridge. 4,174,039, Cl. 206-444.000.
Franks, Albert, to National Research Development Corporation. X-ray interferometers. 4,174,478, Cl. 250-276.000.
Frantzen, John J., to Schulte, Neil B., a part interest. Television shadow mask and method of making same. 4,174,264, Cl. 204-11.000.
Freeman, Anthony L. Bicycle cart attachment. 4,174,120, Cl. 280-204.000.
Freeman Transfer Printing Company, Inc.: *See*—
Durand, David, 4,174,250, Cl. 156-583.300.
Freitag, Dieter: *See*—
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Frezza, Robert, to Samcoe Holding Corporation. High speed horizontal folder. 4,174,101, Cl. 270-79.000.
Fricker, Siegfried. Anchor for the tilt-up and transport of prefabricated building components. 4,173,856, Cl. 52-125.000.
Friedman, Harvey S.; and Lippert, Irving S., to Polaroid Corporation. Photographic processing apparatus. 4,174,164, Cl. 354-86.000.
Fritschy, Hugo: *See*—
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Froehlich, Robert E.; and Baldini, Reginald A., to Foster Wheeler Energy Corporation. Manufacture of ammonium nitrate. 4,174,379, Cl. 423-396.000.
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Fujii, Hitoshi: *See*—
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Fujimoto, Masanori: *See*—
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Ionic pullulan gels and production thereof. 4,174,440, Cl. 536-120.000.
Fujita, Keikichi: *See*—
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Fujiwara, Toshihide; Kaneko, Nobutaka; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Device for moistening blood serum bearing film in electrophoretic apparatus. 4,173,943, Cl. 118-718.000.
Fukami, Kousuke: *See*—
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.
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Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited; and Kao Soap Co., Ltd. Antiviral agent. 4,174,407, Cl. 424-325.000.
Fukui, Yutaka; Hataya, Fumio; and Kashimura, Tetsuo, to Hitachi, Ltd. Highly ductile alloys of iron-nickel-chromium-molybdenum system for gas turbine combustor liner and filler metals. 4,174,213, Cl. 75-134.00F.
Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, to Interelectric Aktiengesellschaft. Method for assembling a stator for an electric machine. 4,173,822, Cl. 29-596.000.
GAF Corporation: *See*—
Dalton, Philip B., 4,174,443, Cl. 544-86.000.
Gafa, Salvatore; and Burzio, Fulvio, to Montedison S.p.A. Detergent compositions containing self-sequestering surfactants. 4,174,306, Cl. 252-546.000.
Gagne, Robert, to PPG Industries, Inc. Method and apparatus utilizing transversely inclined barriers in float glass formation. 4,174,207, Cl. 65-99.00A.
Gahmig, Herbert H.: *See*—
Davis, Pauls; Gahmig, Herbert H.; and Schmolka, Irving R., 4,174,427, Cl. 521-56.000.
Gaiffi, Severino; and Klein, Hans-Peter, to BBC Brown Boveri & Company Limited. Ceramic electrical material with high nonlinear resistance. 4,174,303, Cl. 252-518.000.
Gaines, Albert L., to Combustion Engineering, Inc. Compression hub. 4,174,254, Cl. 176-2.000.

Gaines, Stanley, to Allen-Stevens Corp. Swivel suspension set. 4,174,087, Cl. 248-339.000.
Gaiser, Conrad J. Adhesively bonded hand grip sleeve for hand tools and the like. 4,174,109, Cl. 273-81.600.
Gaiser, Willi: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Gaiser, Willi G.: *See*—
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Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., to CMI Corporation. Method and apparatus for establishing aggregate cascade zones in an apparatus for producing hot mix asphalt. 4,174,181, Cl. 366-2.000.
Gardner, Keith L.; and Fujiwara, Goro, to United States of America, Navy. False target warning system. 4,174,177, Cl. 356-5.000.
Gardon, John L.: *See*—
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.
Garrison, Charles M., to Procter & Gamble Company, The. Density fractionation process to recover vegetable seed proteins. 4,174,314, Cl. 260-123.500.
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., to Procter & Gamble Company, The. Isolation of protein from vegetable seed material. 4,174,315, Cl. 260-123.500.
Garvey Corporation: *See*—
Garvey, Mark C., 4,174,104, Cl. 271-272.000.
Garvey, Mark C., to Garvey Corporation. Conveyor for cards and similar articles. 4,174,104, Cl. 271-272.000.
Garvin, Donald F.: *See*—
Sorgenfrei, Malachi E.; and Garvin, Donald F., 4,174,289, Cl. 252-103.000.
Gast, Lyle E.: *See*—
Bell, Edward W.; and Gast, Lyle E., 4,174,329, Cl. 260-22.0XA.
Gaughan, Edmund J., to Stauffer Chemical Company. Herbicidal active carboxanilide derivatives. 4,174,350, Cl. 260-558.00P.
Gause, Charles M.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; Haas, Friedel; and Roth, Christa, to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen. Ultramicroscopic spectrometer. 4,174,180, Cl. 356-338.000.
Gebrueder Buehler AG: *See*—
Geiger, Armin, 4,174,074, Cl. 241-46.110.
Gehring, Heinz; Bender, Albert; Richter, Gunter; and Froschle, Reinhard, to Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Feeding device for a chip removing tool for machining bores in workpieces, especially a honing tool. 4,173,847, Cl. 51-34.00J.
Geiger, Armin, to Gebrueder Buehler AG. Ball mill. 4,174,074, Cl. 241-46.110.
Gelarden, Dennis R.: *See*—
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.
Gelbein, Abraham P.; Paustian, John E.; and Fanelli, Anthony J. Production of carboxylic acids from nitriles. 4,174,452, Cl. 546-319.000.
General Dynamics Corporation: *See*—
Piesik, Edward T., 4,173,919, Cl. 89-1.800.
General Electric Company: *See*—
Bach, Werner; and Kardasen, George, Jr., 4,174,509, Cl. 336-12.000.
Beckman, Daniel L.; and Stauffer, Earl D., 4,174,036, Cl. 206-223.000.
Brooks, Robert B., 4,173,871, Cl. 62-80.000.
Chipman, Donald L., 4,174,095, Cl. 254-93.00H.
Fiedler, Howard C., 4,174,235, Cl. 148-111.000.
Hamann, John R., 4,174,529, Cl. 361-16.000.
Kresge, James S.; and Sakshaug, Eugene C., 4,174,530, Cl. 361-127.000.
Maher, William M.; and Seaburg, Duane M., 4,174,073, Cl. 241-36.000.
Matson, Stephen L., 4,174,374, Cl. 423-232.000.
Niznik, George E., 4,174,432, Cl. 521-180.000.
Pierce, Linden W., 4,173,996, Cl. 165-105.000.
Sawyer, George N., 4,173,865, Cl. 62-324.000.
Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., 4,174,380, Cl. 423-446.000.
General Tire & Rubber Company, The: *See*—
Ayers, Myron T.; and Corsaut, William J., 4,174,242, Cl. 156-110.00R.
Gormish, Kenneth J.; and Hofelt, Clarence, Jr., 4,173,850, Cl. 51-281.00R.
George P. Johnson Co.: *See*—
Vallee, Robert G.; and Saviano, Arnold P., 4,173,965, Cl. 224-328.000.
Gerike, Andy. Portable temperature sensing device. 4,173,894, Cl. 73-362.800.
Gesellschaft fur Strahlen- und Umweltforschung mbH, Munchen: *See*—
Gebhart, Josef; Heigwer, Gerhard; Heyder, Joachim; Haas, Friedel; and Roth, Christa, 4,174,180, Cl. 356-338.000.
Geurts, Martinus F. A. M., to U.S. Philips Corporation. Television camera comprising a diaphragm control and a controllable picture signal amplification circuit. 4,174,526, Cl. 358-219.000.
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Dechering, Johannes A. B.; and Geurts, Martinus F. A. M., 4,174,525, Cl. 358-217.000.
Giacomini, Joseph M.; and Lichy, David E., to United States of America, Army. Aerial camera mounting means. 4,174,162, Cl. 354-70.000.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, to Montedison S.p.A. Catalysts for the polymerization of olefins. 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, to Montedison S.p.A. Process for polymerizing olefins. 4,174,429, Cl. 526-114.000.
Giglia, Robert D.; Sedlak, John A.; and Lipp, David W., to American Cyanamid Company. Electrochromic devices with polymeric electrolytes. 4,174,152, Cl. 350-357.000.
Gignier, Jean P.; and Bourrelly, Jacques. Process for the reduction of quinidinone to quinidine. 4,174,449, Cl. 546-134.000.
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., to Gulf Oil Corporation. Process for dispersing additives in thermoplastic polymers. 4,174,330, Cl. 260-28.50A.
Gilmont Instruments, Inc.: *See*—
Gilmont, Roger, 4,173,890, Cl. 73-202.000.
Gilmont, Roger, to Gilmont Instruments, Inc. By-pass flowmeter. 4,173,890, Cl. 73-202.000.
Girling Limited: *See*—
Farr, Glyn P. R., 4,173,866, Cl. 60-413.000.
Gitchel, Wayne B.: *See*—
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Global Castors and Hardware Limited: *See*—
James, Michael J., 4,173,810, Cl. 16-47.000.
Glorieux, Gilbert. Optical lens for differential correction. 4,174,156, Cl. 351-168.000.
Goettert, Edward J.; and Van Dyke Tiers, George, to Minnesota Mining and Manufacturing Company. Depositing latent fingerprints and development thereof. 4,174,409, Cl. 427-1.000.
Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, to Peco Limited. Harvesting apparatus. 4,173,859, Cl. 56-330.000.
Goller, Heinz; Schulz, Hans-Hermann; and Leusner, Bernhard, to Bayer Aktiengesellschaft. Pasty compositions for crosslinking organopolysiloxanes to silicone rubber. 4,174,338, Cl. 260-37.0SB.
Goodale Manufacturing Company, Inc.: *See*—
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Goodman Equipment Corporation: *See*—
Watkins, Charles L., 4,174,032, Cl. 198-761.000.
Gorbulev, Efim S.: *See*—
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Gorbunov, Gennady S.: *See*—
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Gorlach, Hans. Ski-binding device for cross-country skis. 4,174,122, Cl. 280-615.000.
Gormish, Kenneth J.; and Hofelt, Clarence, Jr., to General Tire & Rubber Company, The. Method for reducing tangential force variation in pneumatic tires. 4,173,850, Cl. 51-281.00R.
Goto, Toshio: *See*—
Oi, Nakao; Shibata, Tadayoshi; and Goto, Toshio, 4,174,163, Cl. 354-86.000.
Gottschalk, Robert E., to Panavision, Incorporated. Quiet motion picture camera. 4,174,157, Cl. 352-35.000.
Grace, Frederick J. Dump scow. 4,173,935, Cl. 114-36.000.
Grado, Joseph F. Compressive pivot suspension system for an electromagnetic cartridge. 4,174,111, Cl. 274-37.000.
Grafton, David A.: *See*—
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Grahame, Robert E., Jr.: *See*—
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Granzer, Ernold: *See*—
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Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company (Ohio). Oxidative dehydrogenation using chromium-containing catalysts. 4,174,354, Cl. 585-626.000.
Grather, Gunter: *See*—
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Gregg, Richard E., to Royce Equipment Company, Division of McGinnes Manufacturing Co. Clamshell bucket apparatus and method of using same. 4,174,131, Cl. 294-70.000.
Grenia, James D., to Bechtel International Corporation. Underground formed wall single-entry mining method. 4,174,135, Cl. 299-11.000.
Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, to Hoffmann-La Roche Inc. Process for the preparation of methyl 3,4-anhydro-2,6-dideoxy-L-ribo-hexopyranoside. 4,174,344, Cl. 260-348.550.
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Griffin, Thomas J., Jr., to Dow Chemical Company, The. Method of fracturing with gelled organic liquids. 4,174,283, Cl. 252-8.55R.

Grimm, Hans: *See—*
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Gross, Glenn M., to Norlin Industries, Inc. Programmable dynamic filter. 4,173,915, Cl. 84-1.190.

Gruhier, Henri: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
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Gueguen, Jacques: *See—*
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Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, to Telecommunications Radioelectriques et Telephoniques TRT. Phase discriminator in a receiver for a data transmission system. 4,174,489, Cl. 325-320.000.

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Haas, Friedel: *See—*
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Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Anthranilates of oxyalkylated carboxamides. 4,174,455, Cl. 560-49.000.

Hagiwara, Yutaca, to Nissan Motor Company, Limited. Warning device for indicating wear of friction pads in disc brake. 4,174,024, Cl. 188-1.00A.

Halasa, Adel F.; Hall, James E.; and Schulz, Donald N., to Firestone Tire & Rubber Company, The. Process for polymerizing conjugated dienes. 4,174,431, Cl. 526-173.000.

Hall, James E.: *See—*
Halasa, Adel F.; Hall, James E.; and Schulz, Donald N., 4,174,431, Cl. 526-173.000.

Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., to International Flavors & Fragrances Inc. Use of substituted dimethyl dihydroxy benzene and cyclohexadiene compounds for augmenting or enhancing the taste and/or aroma of smoking tobaccos. 4,173,982, Cl. 131-9.000.

Hallstedt, Goran, to Aktiebolaget SKF. Shock absorbing device for sliding bearings. 4,174,136, Cl. 308-5.00R.

Hamaker, Ralph A.; and Buck, Kenneth J., to Xerox Corporation. Belt tracking system. 4,174,171, Cl. 355-3.0BE.

Hamann, John R., to General Electric Company. Protective circuit for zinc oxide varistors. 4,174,529, Cl. 361-16.000.

Hamill, Robert L.; and Stark, W. Max, to Eli Lilly and Company. Antibiotic A-7413 and process for preparation thereof. 4,174,390, Cl. 424-117.000.

Hamill, Robert L.: *See—*
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Hammelmann, Paul. Apparatus for cleaning conduits or the like. 4,173,806, Cl. 15-104.06R.

Hammelmann, Paul. Reciprocating pump. 4,174,194, Cl. 417-567.000.

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Hanson, Douglas R. Dryer for mesh baskets. 4,173,830, Cl. 34-15.000.

Hardy, William B.; Min, Tae B.; and Hoffman, Joseph A., to American Cyanamid Company. Pentaerythrityl diphosphonate-ammonium polyphosphate combinations as flame retardants for olefin polymers. 4,174,343, Cl. 260-45.75B.

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Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, to Idemitsu Kosan Company Limited. Gypsum compositions. 4,174,230, Cl. 106-109.000.

Hataya, Fumio: *See—*
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Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Additional air supply system for an internal combustion engine. 4,173,957, Cl. 123-119.0EC.

Hatuse, Toshikazu: *See—*
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Hauff, Werner. Wall feedthrough fitting. 4,174,126, Cl. 285-158.000.

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den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 4,174,444, Cl. 544-192.000.

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Hedrick, Geoffrey S. Fluid quantity indicator. 4,173,893, Cl. 73-304.00C.

Heenan, Sidney A., to Amerace Corporation. Snowplowable pavement marker and method and apparatus for installing same. 4,174,184, Cl. 404-72.000.

Heesch, Max O., to International Telephone and Telegraph Corporation. Unitary regulator mechanism for multiple window panels. 4,173,845, Cl. 49-350.000.

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Heller, Karl H.; and Schiron, Dieter. Loading platform. 4,174,045, Cl. 220-4.00F.

Helm, Herbert W., to F. L. Smithe Machine Company, Inc. Method for making side seam envelopes from a web. 4,173,922, Cl. 93-63.00M.

Hemming, Frank E., Jr.; and Johnson, Stuart A., to International Paper Company. Process and apparatus for controlling the speed of web forming equipment. 4,174,237, Cl. 156-64.000.

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Hendricks, David J. Hyperextension back brace. 4,173,973, Cl. 128-78.000.

Hensley, Richard K. Toy hoop guide rod. 4,173,841, Cl. 46-220.000.

Hercules Incorporated: *See—*
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Herman, Sal. Sound absorbing article and methods of constructing and utilizing same. 4,174,155, Cl. 351-158.000.

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Hiser, Leland L. Solar energy heating and cooling apparatus and method. 4,173,994, Cl. 165-48.00S.
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Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, to Minolta Camera Kabushiki Kaisha. Power supply control device for cameras. 4,174,165, Cl. 354-105.000.
Hoj, Peter, to Tetra Pak Developpement SA. Apparatus for the manufacture of a continuous film or web of thermoplastic material. 4,174,200, Cl. 425-376.00A.
Holco Investment Inc.: *See—*
Bruzzese, Tiberio, 4,174,320, Cl. 260-239.30P.
Holcroft & Company: *See—*
Schwalm, Donald J., 4,174,097, Cl. 266-87.000.
Holehouse, Stephen L., to Metallgesellschaft Aktiengesellschaft. Process for removing fluorine compounds and sulfur dioxide from exhaust gases. 4,174,375, Cl. 423-240.000.
Holle, Johannes, to Siemens Aktiengesellschaft. Device for attenuating cavity interference waves in a high-frequency electron tube. 4,174,492, Cl. 315-39.000.
Holp, Dennis, to B. F. Goodrich Company, The. Fabric trimmer. 4,173,912, Cl. 83-433.000.
Honig, Helmut; and Pampouchidis, Georgios, to Vianova Kunstharz, A.G. Self-crosslinking resin emulsions for cathodically depositable coating compositions. 4,174,332, Cl. 260-29.2TN.
Hoo, William K. C. Safety container having a slideable closure. 4,174,034, Cl. 206-1.500.
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Rucker, John T.; and Porter, Donald H., 4,174,259, Cl. 204-252.000.
Hori, Shozo: *See—*
Nakano, Tatsuo; Hori, Shozo; and Kishi, Ikuji, 4,174,311, Cl. 260-28.50R.
Howard, William A., to Delta Systems, Inc. Inductive solid state magneto ignition system. 4,173,961, Cl. 123-148.00E.
Huang, Irene C.: *See—*
Schinski, William L.; Huang, Irene C.; and Chan, David C. K., 4,174,210, Cl. 71-118.000.
Hubbard, Donald A., to Imperial Chemical Industries Limited. Process for producing aqueous urea-formaldehyde. 4,174,310, Cl. 260-29.40R.
Hubbard, Elbert G. Volumetric feeder for metering particulate material. 4,174,054, Cl. 222-241.000.
Hubbard, Winchester L.: *See—*
Relyea, Douglas I.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,174,405, Cl. 424-275.000.
Hunter Douglas International N.V.: *See—*
Vecchiarelli, Francis, 4,173,879, Cl. 72-179.000.
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., to Xerox Corporation. Composing reducing camera. 4,174,174, Cl. 355-39.000.
Ibuki, Sumiaki: *See—*
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.
Ichikawa, Singo: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.
Idel, Karsten; Freitag, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Process for the preparation of branched polycarbonates. 4,174,437, Cl. 528-199.000.
Idelson, Elbert M.; to Polaroid Corporation. Yellow 2:1 chrome complexed dye developers. 4,174,221, Cl. 430-225.000.
Idemitsu Kosan Company Limited: *See—*
Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, 4,174,230, Cl. 106-109.000.
Ignatiev, Alexei K.: *See—*
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.
Ii, Akira: *See—*
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Ikeno, Hitoshi, to Kabushiki Kaisha Seikosha. Polishing device. 4,173,848, Cl. 51-55.000.
Ikeura, Kenji; Saito, Masaaki; and Yamane, Michiyoshi, to Nissan Motor Company, Limited. Closed loop fuel control in accordance with sensed engine operational condition. 4,173,956, Cl. 123-119.0EC.
Ikushima, Ichiro: *See—*
Nakamura, Satoshi; Ikushima, Ichiro; Sasaki, Yoshimitsu; Chiba, Katuaki; and Ito, Ryoichi, 4,174,491, Cl. 313-499.000.
Ikuta, Kazuo: *See—*
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Imperial Chemical Industries Limited: *See—*
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.
Hubbard, Donald A., 4,174,310, Cl. 260-29.40R.
Smith, Frank, 4,174,410, Cl. 427-57.000.
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Industrial Electronic Rubber Company: *See—*
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Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.
Institut Francais du Petrole: *See—*
Deschamps, Andre; Dezael, Claude; Gruhier, Henri; and Renault, Philippe, 4,174,383, Cl. 423-573.00R.
Duc, Xuong N., 4,173,804, Cl. 9-8.00P.
Institut National de la Recherche Agronomique: *See—*
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,174,313, Cl. 260-123.500.
Intengan, Franklin S. Adjustable length simulated knotted necktie combination. 4,173,792, Cl. 2-144.000.
Interelectric Aktiengesellschaft: *See—*
Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, 4,173,822, Cl. 29-596.000.
Interface Mechanisms, Inc.: *See—*
Brooks, Robert J., 4,174,078, Cl. 242-75.430.
International Audio Visual, Inc.: *See—*
Dyck, Arthur, 4,174,247, Cl. 156-506.000.
International Business Machines Corporation: *See—*
Andres, Heinrich A.; Kolbe, Hartmut F.; Schlagdenhaufen, Horst; and Schwarzbach, Frank A., 4,174,219, Cl. 430-321.000.
Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., 4,173,818, Cl. 29-571.000.
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, 4,174,538, Cl. 365-2.000.
Cohen, Mitchell S.; and Pugh, Emerson W., 4,174,540, Cl. 365-15.000.
Matthews, John W., decreased; and Stobbs, William M., 4,174,422, Cl. 428-621.000.
White, James M., 4,174,528, Cl. 358-280.000.
International Design and Development Corporation: *See—*
Fishgal, Semyon I., 4,173,983, Cl. 137-13.000.
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Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., 4,173,982, Cl. 131-9.000.
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Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,174,286, Cl. 252-174.110.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

International Harvester Company: *See*—
Beck, Harold D., 4,173,995, Cl. 165-51.000.

International Nickel Company, Inc., The: *See*—
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International Paper Company: *See*—
Hemming, Frank E., Jr.; and Johnson, Stuart A., 4,174,237, Cl. 156-64.000.

International Standard Electric Corporation: *See*—
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International Telephone and Telegraph Corporation: *See*—
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INTERx Research Corporation: *See*—
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Irwin, Howard D.: *See*—
Bogar, William H.; and Irwin, Howard D., 4,174,140, Cl. 308-137.000.

Ishihara, Masamitsu. Power plant for simultaneously generating electric power and pneumatic pressure. 4,173,951, Cl. 123-2.000.

Ito, Hajime: *See*—
Sasaki, Toshimitsu; Fujita, Keikichi; and Ito, Hajime, 4,174,414, Cl. 428-85.000.

Ito, Hiroshi: *See*—
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.

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ITT Industries, Inc.: *See*—
Paschke, Klaus, 4,174,251, Cl. 156-643.000.
Schaefer, Peter; and Doerre, Wolfgang, 4,174,088, Cl. 248-395.000.

Ivachev, Leonid M. Pivoted lever brake structure. 4,174,025, Cl. 188-72.600.

Iwao Tabushi: *See*—
Kobuke, Yoshiaki, 4,174,319, Cl. 260-239.0BC.

J. T. Baker Chemical Company: *See*—
Seidenberger, James W.; and Michelotti, Francis W., 4,174,292, Cl. 252-189.000.

Jackson, David D.: *See*—
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., 4,174,391, Cl. 424-180.000.

Jacobsen, Robert G.: *See*—
Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., 4,174,536, Cl. 364-200.000.

Jahoda, John, to Carrier Corporation. Formed coil assembly. 4,173,998, Cl. 165-182.000.

James D. Pauls & J. Claybrook Lewis & Associates, Ltd.: *See*—
Capra, Nicholas G.; and Antenore, Ronald L., 4,174,055, Cl. 222-319.000.

James D. Pauls, Ltd.: *See*—
Capra, Nicholas G.; and Hammett, Roy, 4,174,052, Cl. 222-207.000.

James, Michael J., to Global Castors and Hardware Limited. Twin-wheel castor. 4,173,810, Cl. 16-47.000.

Jannsen, Klaus-Uwe: *See*—
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
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Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, to Laboratories Made, S.A. 7,10-Dimethyl-5,9-imino-4,5,8,9-tetrahydro-cyclooct[b]thiophenes and a process for obtaining it. 4,174,396, Cl. 424-256.000.

Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, to Laboratorios Made, S.A. 2-Furyl-(3,4-dimethyl-2-pyridyl)-carbinol. 4,174,451, Cl. 546-283.000.

Jarvik, Robert K., to University of Utah. Total artificial hearts and cardiac assist devices powered and controlled by reversible electro-hydraulic energy converters. 4,173,796, Cl. 3-1.700.

Jaseck, James E.; and Pentland, Alex M., to Ford Motor Company. Ball joint and pole assembly for starter motor. 4,173,901, Cl. 74-6.000.

Jaymin Research Corporation: *See*—
Momin, Abdulmajid U., 4,173,970, Cl. 128-736.000.

Jeffery, Thomas C., to PPG Industries, Inc. Method of operating an electrolytic cell having an asbestos diaphragm. 4,174,266, Cl. 204-98.000.

Jelmorini, Gerardus: *See*—
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., 4,174,477, Cl. 219-121.00P.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Congleton, Robert S., 4,174,150, Cl. 350-174.000.

Jessel, Peter G.: *See*—
Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., 4,174,536, Cl. 364-200.000.

Jimenez, Rosa Llobera: *See*—
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.

Johannesen, Donald D., to Bendix Corporation, The. Dash pot for a hydraulic actuator for a driven brake. 4,174,026, Cl. 188-361.000.

John, Clarence D., Jr., to Westinghouse Electric Corp. Fluid pressure method for recovering fuel pellets from nuclear fuel elements. 4,174,369, Cl. 423-4.000.

Johnson, Nira C., to Rockwell International Corporation. Method and apparatus for measuring gas flow. 4,173,891, Cl. 73-231.00M.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. Pyran analogs of 5-hydroxy-PGI_1. 4,174,441, Cl. 542-426.000.

Johnson, Stuart A.: *See*—
Hemming, Frank E., Jr.; and Johnson, Stuart A., 4,174,237, Cl. 156-64.000.

Johnston, Dean E., to Torrington Company, The. Thrust bearing and separator. 4,174,138, Cl. 308-235.000.

Jones, Thomas R.: *See*—
Clark, Norman O.; and Jones, Thomas R., 4,174,279, Cl. 210-54.000.

Josam Manufacturing Co.: *See*—
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,173,800, Cl. 4-207.000.

Josemans, Leonardus J., to Cutler-Hammer, Inc. Pivoted-actuator switch with integral off-lock. 4,174,472, Cl. 200-68.000.

Joy Manufacturing Company: *See*—
Hibbard, George A., 4,174,010, Cl. 173-78.000.

Jubilee Manufacturing Co.: *See*—
Cleary, Mark R., 4,174,516, Cl. 340-63.000.

Jurva, Edsel O.; and Mosman, Howard D., to Medtronic, Inc. Seal arrangement for facilitating hermeticity leakage testing. 4,174,424, Cl. 429-90.000.

Kabushiki Kaisha Sanwa Denki Seisakusho: *See*—
Kuga, Yasuo, 4,174,500, Cl. 324-115.000.

Kabushiki Kaisha Seikosha: *See*—
Ikeno, Hitoshi, 4,173,848, Cl. 51-55.000.

Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, to Nippon Oil Company, Limited. Method of detecting defective portions of metallic tank having thermally protective coating of polyurethane foam. 4,174,480, Cl. 250-342.000.

Kaiser, Emil T. Synthesis of steroids. 4,174,345, Cl. 260-397.100.

Kaizer, Alexandr A.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Kali und Salz AG: *See*—
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Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 2,3-Dimethyl-5-(2,2,3-trimethyl-3-cyclopenten-1-yl)-2-pentanol, perfume compositions, colognes and perfumed articles containing same and process for preparing same. 4,174,287, Cl. 252-174.110.

Kanehori, Keiichi: *See*—
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Kaneko, Katsuhiro: *See*—
Yoshida, Kazuetsu; Seki, Michiharu; Kanehori, Keiichi; Kaneko, Katsuhiro; and Sakurai, Yo, 4,174,373, Cl. 423-239.000.

Kaneko, Nobutaka: *See*—
Fujiwara, Toshihide; Kaneko, Nobutaka; and Fujimori, Ryo, 4,173,943, Cl. 118-718.000.

Kao Soap Co., Ltd.: *See*—
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.
Kawaguchi, Hikotarou; and Kobayashi, Hisawo, 4,174,029, Cl. 198-431.000.

Kardasen, George, Jr.: *See*—
Bach, Werner; and Kardasen, George, Jr., 4,174,509, Cl. 336-12.000.

Karz, Allen E. Continuous electrocardiogram monitoring method and system for cardiac patients. 4,173,971, Cl. 128-702.000.

Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Floating-type anti-oil anti-impact anti-wave barrier. 4,174,186, Cl. 405-71.000.

Kashimura, Tetsuo: *See*—
Fukui, Yutaka; Hataya, Fumio; and Kashimura, Tetsuo, 4,174,213, Cl. 75-134.00F.

Kass, Gus S., to American Lecithin Company. Water soluble lecithin composition. 4,174,296, Cl. 252-312.000.

Kataoka, Hiroshi: *See*—
Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, 4,174,413, Cl. 428-35.000.

Kato, Hidefumi: *See*—
Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, 4,174,428, Cl. 525-334.000.

Kato, Yutaka: *See*—
Ouchi, Teruo; and Kato, Yutaka, 4,174,178, Cl. 356-39.000.

Kato, Yuzo; Ii, Akira; and Oniki, Tetsuya, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Carburetor. 4,173,958, Cl. 123-136.000.

Katohgi, Katsuya: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Kavanaugh, Richard J.: *See*—
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Kawaguchi, Hikotarou; and Kobayashi, Hisawo, to Kao Soap Co., Ltd. Device for supplying linear materials. 4,174,029, Cl. 198-431.000.

Kawaguchi, Toshiyuki; and Hayashi, Tomio, to NGK Insulators, Ltd. Rod-type insulator having improved withstand voltage characteristics under a contaminated condition. 4,174,464, Cl. 174-212.000.

Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Laser manipulator apparatus with double pivotal mirrors. 4,174,154, Cl. 350-299.000.

Kawashima, Hideyuki: *See*—
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Kayserling, Ulrich, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. High speed bogie. 4,173,933, Cl. 105-182.00R.

Keller, George E., II: *See*—
Marcinkowsky, Arthur E.; Keller, George E., II; and Verma, Surendra K., 4,174,353, Cl. 585-835.000.

Kelley, Richard L. Portable lighting fixture. 4,174,532, Cl. 362-102.000.

Kennametal Inc.: *See*—
Shearer, Thomas R., 4,174,093, Cl. 254-29.00R.

Kennedy, Ronald J., to Leggett & Platt, Incorporated. Sofa-sleeper. 4,173,803, Cl. 5-13.000.

Khait, George. Drafting instrument. 4,173,829, Cl. 33-27.00C.

Khurgin, Boris. Apparatus for measurement of quantity of liquid in container. 4,173,892, Cl. 73-304.00C.

Khutoretsky, Gary M.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, to Toyo Soda Manufacturing Co., Ltd. Process for producing porous polystyrene gel. 4,174,430, Cl. 521-146.000.

Kiejzik, Paul A. Microfilm jacket microfilm feeding device and process. 4,173,837, Cl. 40-159.000.

Kienow, Sigismund; and Briem, Karl, to Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft. Mold for firing bodies of silica- or alumina-containing granules. 4,174,089, Cl. 249-80.000.

Kihara, Keiichi: *See*—
Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.

Kilsdonk, Dennis J.: *See*—
Smith, James L.; Helenberg, Harold W.; and Kilsdonk, Dennis J., 4,174,510, Cl. 336-62.000.

Kimberly-Clark Corporation: *See*—
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Kimm, Otfried; Hammes, Theo; and Loebler, Peter, to Mauser Kommandit-Gesellschaft. Original closure member. 4,174,044, Cl. 215-252.000.

Kimura, Takeji: *See*—
Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, 4,173,916, Cl. 84-1.090.

Kinoshita, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing a dynamic random access memory using MOS FETS. 4,173,819, Cl. 29-571.000.

Kinoshita, Tomoo, to Nihon Repro Machine Kogyo Kabushiki Kaisha. Foreign material removing device in synthetic resin reclaiming machine. 4,174,198, Cl. 425-135.000.

Kirk, James F.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Kirk, Leelin F.: *See*—
Heyne, Cecil I.; and Kirk, Leelin F., 4,174,118, Cl. 280-179.00R.

Kirpichenkov, Alexandr G. Straightway valve. 4,173,985, Cl. 137-512.100.

Kise, Yoshio: *See*—
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.

Kishi, Ikuji: *See*—
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Kissick, Thomas P.: *See*—
Wade, Peter C.; and Kissick, Thomas P., 4,174,442, Cl. 544-62.000.

Kistemaker, Jacob, to Ultra Centrifuge Nederland N.V. Reactor based on a magnetohydrodynamically driven supersonic gas vortex. 4,174,256, Cl. 176-39.000.

Kiwala, Jacob: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,174,286, Cl. 252-174.110.

Klein, Hans-Peter: *See*—
Gaiffi, Severino; and Klein, Hans-Peter, 4,174,303, Cl. 252-518.000.

Kleinschafer, Richard: *See*—
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Kline, Charles M., to Sperry Rand Corporation. Overload protective device. 4,174,072, Cl. 241-35.000.

Kluge, Arthur F.; and Harrison, Ian T., to Syntex (USA) Inc. Treatment of lactic acidosis in ruminants. 4,174,399, Cl. 424-271.000.

Klushin, Dmitry N.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Knabe, Bernd; Lang, Hans-Jochen; and Granzer, Ernold, to Hoechst Aktiengesellschaft. Thiazolidine derivatives. 4,174,397, Cl. 424-270.000.

Knapp, Heinrich; Bosch, Franz-Ulrich; and Schnepf, Gunther, to Robert Bosch GmbH. Bimetal device with an electrical heating element. 4,174,511, Cl. 337-107.000.

Knauth, Berthold A., to Knauth Design, Inc. Fluid flow regulating systems. 4,174,065, Cl. 236-49.000.

Knauth Design, Inc.: *See*—
Knauth, Berthold A., 4,174,065, Cl. 236-49.000.

Knolle, Jurgen C.; and Grimm, Hans, to Saat- und Erntetechnik GmbH. Laminar seed carriers and method of preparing same. 4,173,844, Cl. 47-56.000.

Knowles, James G.: *See*—
Levington, Henry J.; and Knowles, James G., 4,174,016, Cl. 180-89.150.

Kobayashi, Hisawo: *See*—
Kawaguchi, Hikotarou; and Kobayashi, Hisawo, 4,174,029, Cl. 198-431.000.

Kobuke, Yoshiaki, to Iwao Tabushi. 12-Alkyl-1,4,7,10-tetraazacyclotridecane. 4,174,319, Cl. 260-239.0BC.

Kodera, Katsuji. Massaging machine. 4,173,972, Cl. 128-52.000.

Koepke, Lee E.: *See*—
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.

Kokeisl, Theodor. Ski-tie device. 4,173,811, Cl. 24-73.0SG.

Kolbe, Hartmut F.: *See*—
Andres, Heinrich A.; Kolbe, Hartmut F.; Schlagdenhaufen, Horst; and Schwarzbach, Frank A., 4,174,219, Cl. 430-321.000.

Kolbin, Nikolai A.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, to Tokyo Ohka Kogyo Kabushiki Kaisha. Positive-type O-quinone diazide containing photoresist compositions. 4,174,222, Cl. 430-190.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Saito, Tomio, 4,174,050, Cl. 222-43.000.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.

Kontsov, Jury M.: *See*—
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.

Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Silverplated vapor deposition chamber. 4,173,944, Cl. 118-719.000.

Koritala, Sambasivarao, to United States of America, Agriculture. Preparation of highly active copper-silica catalysts. 4,174,300, Cl. 252-454.000.

Korlatzki, Rudi; and Schumacher, Gunter, to Naturin-Werk Becker & Co. Polyurethanes and food casings made therefrom. 4,174,436, Cl. 528-80.000.

Korolkov, Anatoly G.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Kosaka, Yoshiharu. Double-layered wooden arch truss. 4,173,857, Cl. 52-642.000.

Kotlarewsky, Paul, to Northern Telecom Limited. Master-slave voltage regulator employing pulse width modulation. 4,174,534, Cl. 363-26.000.

Kouda, Masanori, to Atsugi Motor Parts Co., Ltd. Power steering system. 4,173,987, Cl. 137-625.230.

Koushiafes, Nicholas J. Furnace air filter. 4,174,205, Cl. 55-354.000.

Kovac, M. Jane. Aerodynamic toy. 4,173,839, Cl. 46-74.00D.

Kraft, Winfried; Reinheimer, Gunter; and Leiter, Herbert, to Ernst Leitz Wetzlar GmbH. Exposure meter for photomicrography. 4,174,159, Cl. 354-23.00R.

Kramer, Justin A. Dual speaker. 4,174,019, Cl. 181-159.000.

Kramer, Petrus A.; and Austermuhle-Bertola, Helena, to Shell Internationale Research Maatschappij B. V. Preparation of cyclopropanecarbonitriles. 4,174,348, Cl. 260-464.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 3,3-Dichloro-2-azetidinone derivatives. 4,174,317, Cl. 260-239.00A.

Krasnow, Leonard L.: *See*—
Lustig, Leopold P.; and Krasnow, Leonard L., 4,173,828, Cl. 433-87.000.

Krebs Engineers: *See*—
Martin, David L., 4,174,275, Cl. 209-211.000.

Kreiskorte, Heinz, to Thyssen Industrie AG. Ring rolling machine. 4,173,877, Cl. 72-105.000.

Kresge, James S.; and Sakshaug, Eugene C., to General Electric Company. Voltage surge arrester device. 4,174,530, Cl. 361-127.000.

Kress, Hermann: *See*—
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.

Kressel, Henry; and Spak, Mark A., to RCA Corporation. Method of defining contact openings in insulating layers on semiconductor devices without the formation of undesirable pinholes. 4,174,252, Cl. 156-653.000.

Krieger, Gregory A.: *See*—
Slosiarek, Michael L.; and Krieger, Gregory A., 4,174,116, Cl. 280-163.000.

Ku, Paul H. Automatic vacuum cleaner. 4,173,809, Cl. 15-319.000.

Kudara, Hajime: *See*—
Matsuda, Sumio; and Kudara, Hajime, 4,174,339, Cl. 260-40.00R.

Kuga, Yasuo, to Kabushiki Kaisha Sanwa Denki Seisakusho. Scale plate for measuring instruments. 4,174,500, Cl. 324-115.000.

Kulischenko, Walter; and Capdevielle, Martin J., to Pennwalt Corporation. Remotely actuated marine steering system. 4,173,937, Cl. 114-144.00R.

Kunzler & Co.: *See*—
Maier, Jakob; and Hoefelmayr, Tilman, 4,173,946, Cl. 119-14.360.

Kurath, Paul: *See*—
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,174,312, Cl. 260-112.50R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.

Kurita, Ryuichi: *See*—
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.

Kuroda, Yasuhisa: *See*—
Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, 4,174,428, Cl. 525-334.000.

Kusaka, Toshitsugu: *See*—
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.

Kusuyama, Michio, to Olympus Optical Co., Ltd. Adjustable directivity microphone incorporated in a tape recorder casing. 4,174,469, Cl. 179-121.00D.

Kvita, Vratislav: *See*—
Baumann, Marcus; Kvita, Vratislav; Roth, Martin; and Waterhouse, John S., 4,174,326, Cl. 260-326.00E.

Laboratories Made, S.A.: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.

Laboratorios Made, S.A.: *See*—
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,174,009, Cl. 165-45.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Long-period thermal storage accumulators. 4,174,009, Cl. 165-45.000.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,174,009, Cl. 165-45.000.

Lander, Joseph: *See*—
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Landgraf, Helmut, to Mannesmann Aktiengesellschaft. Cooled mandrel. 4,173,880, Cl. 72-201.000.

Lane, Howard K.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

Lane, John N., to Xerox Corporation. Cleaning methods and apparatus for a photocopying device. 4,174,172, Cl. 355-15.000.

Lang, Hans-Jochen: *See*—
Knabe, Bernd; Lang, Hans-Jochen; and Granzer, Ernold, 4,174,397, Cl. 424-270.000.

Langlais, Frantz; and Postel, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Prosthesis for arthroplasty of the hip. 4,173,797, Cl. 3-1.912.

Langlois, Guy B.; and Spain, Raymond G., to Hitco. Temporary fabric and method and apparatus for weaving same. 4,173,990, Cl. 139-440.000.

Lassota, Marek J. Rotary compressor and process of compressing compressible fluids. 4,174,195, Cl. 418-1.000.

Lather, Dieter: *See*—
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Spray gun assembly. 4,174,070, Cl. 239-340.000.

Lau, George W.; and Bujnowski, Edward J., to Binks Manufacturing Company. Spray gun assembly. 4,174,071, Cl. 239-348.000.

Laurent, Francois, to Bolex International SA. Varifocal objective with focal length adjustment. 4,174,153, Cl. 350-184.000.

Law, Melvin K.: *See*—
Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., 4,174,241, Cl. 156-102.000.

Lawrie, William E., to Babcock & Wilcox Company, The. Apparatus for locating defective nuclear fuel elements. 4,174,255, Cl. 176-19.0LD.

Laycock, John N. C.: *See*—
Bertenshaw, Barry W.; Combe, Edward C.; Tidy, David C.; and Laycock, John N. C., 4,174,334, Cl. 260-29.60M.

Lear Siegler, Inc.: *See*—
Sigman, John J., Jr., 4,173,920, Cl. 409-37.000.

Lee, Glyn E.: *See*—
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., 4,174,391, Cl. 424-180.000.

Lee, Harry W., Jr., to Reynolds Metals Company. Mounting for ironing dies. 4,173,882, Cl. 72-349.000.

Leggett & Platt, Incorporated: *See*—
Kennedy, Ronald J., 4,173,803, Cl. 5-13.000.

Le Helloco, Roger, to AMP Incorporated. Housing for an electrical terminal. 4,174,144, Cl. 339-59.00R.

Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., to M & T Chemicals Inc. Aqueous heat curable particulate coating composition of elastomeric emulsion copolymer and thermosetting copolymer. 4,174,336, Cl. 260-29.7UP.

Leipold, Ludwig: *See*—
Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, 4,174,535, Cl. 363-147.000.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, to Argus Chemical Corporation. Polyhydric phenol coester stabilizers. 4,174,297, Cl. 252-399.000.

Leiter, Herbert: *See*—
Kraft, Winfried; Reinheimer, Gunter; and Leiter, Herbert, 4,174,159, Cl. 354-23.00R.

Leitermann, Wulf, to Audi NSU Auto Union Aktiengesellschaft. Rotary-piston machine having a liquid-cooled piston. 4,174,197, Cl. 418-84.000.

Lejeune, Daniel, to Compagnie Generale des Etablissements Michelin. Radially reinforced wheel rims of moldable material. 4,173,992, Cl. 152-381.100.

Lendl, Josef, to Triumph Werke Nurnberg A.G. Needle printing head. 4,174,182, Cl. 400-124.000.

Lenz, Dieter; and Tragner, Erich, to Swiss Aluminium Ltd. Method of manufacturing sheets, strips and foils from age hardenable aluminum alloys of the Al-Si-Mg-type. 4,174,232, Cl. 148-2.000.

Leon, Joseph L. Variable tilt rotating pot cooker and mixer. 4,173,925, Cl. 99-348.000.

Leopoldi, Norbert; and Heinrich, William P. Apparatus for cutting pills. 4,173,826, Cl. 30-124.000.

Lerch, Ulrich: *See*—
Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,174,458, Cl. 562-463.000.

Lester Construction Co.: *See*—
Yago, Jeffry R., 4,174,013, Cl. 180-6.200.

Leusner, Bernhard: *See*—
Goller, Heinz; Schulz, Hans-Hermann; and Leusner, Bernhard, 4,174,338, Cl. 260-37.0SB.

Leveskis, Newton G., to Custom Research and Development. Metal oxide remover containing a strong mineral acid, citric acid and a basic ammonia derivative. 4,174,290, Cl. 252-142.000.

Levington, Henry J.; and Knowles, James G., to Clayton Dewandre Company Limited. Hydraulic cab tilting systems. 4,174,016, Cl. 180-89.150.

Lewarchik, Ronald J.: *See*—
Birkmeyer, William J.; Erikson, J. Alden; and Lewarchik, Ronald J., 4,174,337, Cl. 260-31.40R.

Li, Jorge P.; and Becker, Frank C., to Abbott Laboratories. N-(Acenaphthenyl)maleimides. 4,174,342, Cl. 260-45.80N.

Lichtenberger, William J., to Westinghouse Air Brake Company. Relay latching apparatus. 4,174,508, Cl. 335-202.000.

Lichy, David E.: *See*—
Giacomini, Joseph M.; and Lichy, David E., 4,174,162, Cl. 354-70.000.

Liebert, Karl-Heinz; and Tischer, Werner, to Zahnradfabrik Friedrichshafen AG. Arrangement for control of two hydraulic pressure systems, including booster steering control. 4,174,018, Cl. 180-132.000.

Liebetruth, Reiner, to Siemens Aktiengesellschaft. Tomographic X-ray apparatus for the production of transverse layer images. 4,174,481, Cl. 250-445.00T.

Lindmayer, Joseph, to Semix, Incorporated. Silicon-impregnated foraminous sheet. 4,174,234, Cl. 148-33.000.

Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W. Method and apparatus for handling brick. 4,173,910, Cl. 83-29.000.

Lineberry, Cletus E.; Buckner, John G.; and Harris, Jimmy W. Method and apparatus for hacking and stacking brick. 4,173,911, Cl. 83-29.000.

Lipp, David W.: *See*—
Giglia, Robert D.; Sedlak, John A.; and Lipp, David W., 4,174,152, Cl. 350-357.000.

Lippert, Irving S.: *See*—
Friedman, Harvey S.; and Lippert, Irving S., 4,174,164, Cl. 354-86.000.

Little, Clifton W.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., to Uniroyal, Inc. Carbamate. 4,174,457, Cl. 560-134.000.

Lockwood Corporation: *See*—
Ellis, Malcolm P., 4,174,001, Cl. 171-17.000.

Loebler, Peter: *See*—
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,174,044, Cl. 215-252.000.

Loeffler, Herbert H., to Ciba-Geigy Corporation. Pump type dispenser with continuous flow feature. 4,174,056, Cl. 222-321.000.

Logan, Gilbert J. Modular church steeple. 4,173,853, Cl. 52-57.000.

Looker, Brian E.: *See*—
Barton, Derek H. R.; Sammes, Peter G.; Hewitt, Graham; Looker, Brian E.; and Underwood, William G. E., 4,174,318, Cl. 260-239.00A.

Lorenz, Helmut: *See*—
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,173,944, Cl. 118-719.000.

Lucas Industries Limited: *See*—
Sosnowski, Stanislaw J. A.; and Potter, James C., 4,173,959, Cl. 123-139.0AP.

Luders, Walter; Herwig, Walter; van Spankeren, Ulrich; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Plastic molding composition containing a filler. 4,174,340, Cl. 260-42.140.

Ludlow Corporation: *See*—
Whiting, Philip C., Jr., 4,174,038, Cl. 206-389.000.

Lundgren, Bengt, to SKF Nova AB. Device for transforming a rotational motion into a linear motion. 4,173,907, Cl. 74-459.000.

Lundgren, Bert K. G.; and Westin, Urban, to AB Nynas-Petroleum; and AB Westin and Backlund. Manufacturing moulds or mould cores. 4,174,225, Cl. 106-38.600.

Lundin, Alyce; and Bravin, Robert V. Racquetball or squash safety mask. 4,173,795, Cl. 2-425.000.

Lustig, Leopold P.; and Krasnow, Leonard L., to Lustig, Leopold Paul. Interchangeable tool operating apparatus with plural motion. 4,173,828, Cl. 433-87.000.

Lustig, Leopold Paul: *See*—
Lustig, Leopold P.; and Krasnow, Leonard L., 4,173,828, Cl. 433-87.000.

Lux, Joseph W.; and Varanelli, John M., to Robertshaw Controls Company. Method of joining two abutting metal members together. 4,173,815, Cl. 29-432.100.

Lynch, Thomas J.: *See*—
Gilbert, Ronald E.; Lynch, Thomas J.; and Rowatt, Robert J., 4,174,330, Cl. 260-28.50A.

M & T Chemicals Inc.: *See*—
Leiner, Howard H.; Koepke, Lee E.; Gelarden, Dennis R.; and Gardon, John L., 4,174,336, Cl. 260-29.7UP.

Mack, Halmer B., to Goodale Manufacturing Company, Inc. Carton hold-down apparatus. 4,173,921, Cl. 93-36.300.

MacLeod, Donald R., to Rexnord Inc. Lubricating system and method. 4,174,031, Cl. 198-501.000.

Macleod, John G., to Rockwell International Corporation. Rotary valve with stem seal means. 4,174,092, Cl. 251-214.000.

Maeda Industries, Ltd.: *See*—
Yamasaki, Kazuto, 4,174,099, Cl. 267-168.000.

Magarian, Gerald M., to Ameron, Inc. Method and apparatus for wiping resin from filament wound pipe. 4,174,243, Cl. 156-175.000.

Magnusson, Sten E.: *See*—
Broger, Lars I.; and Magnusson, Sten E., 4,174,466, Cl. 179-18.0AD.

Maher, William M.; and Seaburg, Duane M., to General Electric Company. Multi container interlocked food machine with a safety switch for each container. 4,174,073, Cl. 241-36.000.

Maier, Jakob; and Hoefelmayr, Tilman, to Kunzler & Co. Milking cup. 4,173,946, Cl. 119-14.360.

Maier, Siegfried, to Dupro AG. Cleaning implement. 4,173,807, Cl. 15-179.000.

Maistros, Thomas J.: *See*—
Thomas, Eric W.; and Maistros, Thomas J., 4,174,244, Cl. 156-242.000.

Makino, Keisuke: *See*—
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Mandel, Jerome. Central system for controlling remote devices over power lines. 4,174,517, Cl. 340-310.00A.

Mannesmann Aktiengesellschaft: *See*—
Altenbokum, Karlheinz; Hansgen, Klaus; and Hiersig, Heinz M., 4,173,906, Cl. 74-410.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.
Landgraf, Helmut, 4,173,880, Cl. 72-201.000.

Mar, Sergio R. Electric hand drill powered portable grinder. 4,173,849, Cl. 51-98.00R.

Marble, Orlin G. Decorative article. 4,173,843, Cl. 47-41.00R.

Marcinkowsky, Arthur E.; Keller, George E., II; and Verma, Surendra K., to Union Carbide Corporation. Olefin separation process. 4,174,353, Cl. 585-835.000.

Marconi, Gary G.: *See*—
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.

Margotte, Dieter: *See*—
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, 4,174,325, Cl. 260-32.10N.

Marlowe, Frank J.; and Anderson, Charles H., to RCA Corporation. Flat display device. 4,174,523, Cl. 358-67.000.

Marra, Dorothea C.: *See*—
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,174,386, Cl. 424-47.000.

Martacto Naviera S.A.: *See*—
Secord, Herbert C.; and Schwendtner, Alfred H., 4,173,936, Cl. 114-74.00A.

Martin, David L., to Krebs Engineers. Hydrocyclone apparatus and method for underflow density control. 4,174,275, Cl. 209-211.000.

Martin, Harry F.: *See*—
Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., 4,173,869, Cl. 60-646.000.

Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., to Westinghouse Electric Corp. Apparatus and method for determining the rotor temperature of a steam turbine. 4,173,869, Cl. 60-646.000.

Martin, Jerry R.: *See*—
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, 4,174,312, Cl. 260-112.50R.

Martin, Richard L., to American Safety Equipment Corporation. Pressurized gas flow control valve and assembly thereof with reducer regulator. 4,173,986, Cl. 137-613.000.

Martineau, Philippe M., to Regie Nationale des Usines Renault. Method of fabricating a flexible fuel tank. 4,174,245, Cl. 156-245.000.

Maruoka, Hiroyuki: *See*—
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Marvin Glass & Associates: *See*—
Meyer, Burton C.; and Hicks, Alan A., 4,174,105, Cl. 272-31.00A.

Marzolf, Rene, to VDO Adolf Schindling AG. Device for transmission of measurement values. 4,174,515, Cl. 340-58.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Kayserling, Ulrich, 4,173,933, Cl. 105-182.00R.

Maschinenfabrik Gehring Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See*—
Gehring, Heinz; Bender, Albert; Richter, Gunter; and Froschle, Reinhard, 4,173,847, Cl. 51-34.00J.

Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Exposure control system. 4,174,161, Cl. 354-33.000.

Mashio, Tasuku: *See*—
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,174,421, Cl. 428-432.000.

Massachusetts Institute of Technology: *See*—
Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., 4,174,536, Cl. 364-200.000.

Massey-Ferguson Inc.: *See*—
Schwandt, Marvin W.; and Hern, John F., 4,174,129, Cl. 292-216.000.

Massip, Jean C.: *See*—
Chastagnier, Jean; and Massip, Jean C., 4,174,501, Cl. 325-56.000.

Masson Scott Thrissell Engineering, Ltd.: *See*—
Byrt, Graham A. B.; and Riddler, Douglas E., 4,173,905, Cl. 74-356.000.

Mathis, Joseph S. Vehicle cover assembly. 4,174,134, Cl. 296-136.000.

Matlock, Tony L. Standard surface assembly for calibrating a variable speed friction tester. 4,173,885, Cl. 73-1.00R.

Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, to Osaka Soda Co. Ltd. Uncured chlorinated polyethylene composition with hexamethylphosphoric triamide and mercaptotriazine. 4,174,341, Cl. 260-45.70S.

Matson, Stephen L., to General Electric Company. Maintaining the separation efficiency of immobilized liquid membranes in gas separation methods and apparatus. 4,174,374, Cl. 423-232.000.

Matsubara, Katsumi: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Matsubara, Yuji: *See*—
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Matsuda, Sumio; and Kudara, Hajime, to Chugoku Marine Paints Ltd. Anti-fouling paint composition. 4,174,339, Cl. 260-40.00R.

Matsuda, Yasumasa: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Matsuo, Jon T.; and Boyum, Ronald S., to United States of America, Navy. Dual parachute ripcord cable releasable clamp. 4,174,084, Cl. 244-149.000.

Matsuoka, Yoshitaka: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, 4,173,916, Cl. 84-1.090.

Matte, Yvanhoe; and Walker, G. Russel, to United States of America, Army. Safety shutter for a fuze. 4,173,932, Cl. 102-254.000.

Matthews, John W., decreased; and Stobbs, William M., to International Business Machines Corporation. Growing epitaxial films when the misfit between film and substrate is large. 4,174,422, Cl. 428-621.000.

Maunder, Martha. Back pack. 4,174,059, Cl. 224-209.000.

Mauser Kommandit-Gesellschaft: *See*—
Kimm, Otfried; Hammes, Theo; and Loebler, Peter, 4,174,044, Cl. 215-252.000.

May & Baker Limited: *See*—
Chapman, Robert F.; Jackson, David D.; and Lee, Glyn E., 4,174,391, Cl. 424-180.000.

Mayer, Jurgen: *See*—
Futterer, Bodo; Mayer, Jurgen; and Fritschy, Hugo, 4,173,822, Cl. 29-596.000.

Mayes, Warden W., to Cosden Technology, Inc. High severity process for the production of aromatic hydrocarbons. 4,174,270, Cl. 208-64.000.

Mayes, Warden W., to Cosden Technology, Inc. High severity reforming. 4,174,271, Cl. 208-64.000.

Mayfield, Harold. Record handling device. 4,174,130, Cl. 294-25.000.

Mazzeo, Charles F.: *See*—
Waddington, William T.; and Mazzeo, Charles F., 4,174,147, Cl. 339-176.0MP.

McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Method for preparing hepatitis B immune globulin. 4,174,388, Cl. 424-86.000.

McCarthy, Donald C.; and Rayl, Martin, to RCA Corporation. Printed circuit board with increased arc track resistance. 4,174,531, Cl. 361-411.000.

McCollum, Patrick E.: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.

McCord, Robert C., to Diamond International Corporation. Egg drying apparatus. 4,173,831, Cl. 34-236.000.

McDonald, William D. Portable apparatus for fabricating wooden trusses. 4,174,061, Cl. 227-152.000.

McDonnell Douglas Corporation: *See*—
Meares, Lawrence G.; and Simpson, Robert D., 4,174,465, Cl. 179-15.00A.

McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, to Rockwell International Corporation. Monolithic solid state power controller. 4,174,496, Cl. 323-9.000.

McFarland, Keith E., to Xerox Corporation. Electrostatic printing machine with improved web-developing system. 4,173,945, Cl. 118-660.000.

McKlveen, John R. Textured synthetic fiber yarn and process for making same. 4,173,860, Cl. 57-247.000.

McManus, Sam P.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

McNeil Laboratories, Incorporated: *See*—
Rasmussen, Chris R., 4,174,401, Cl. 424-273.00R.

Meares, Lawrence G.; and Simpson, Robert D., to McDonnell Douglas Corporation. Signal transmitting interface system combining time compression and multiplexing. 4,174,465, Cl. 179-15.00A.

Meckstroth, Alan F.; and Pease, James F. Method of making a hose clamp with tangential screw. 4,173,816, Cl. 29-526.00R.

Medtronic, Inc.: *See*—
Jurva, Edsel O.; and Mosman, Howard D., 4,174,424, Cl. 429-90.000.

Melander, Theodore A.; and Charnley, Ralph L., to Pako Corporation. Anti-oxidation fluid replenisher control system for processor of photosensitive material. 4,174,169, Cl. 354-324.000.

Melnick, Joseph L.; and Wallis, Craig. Resin and method for removing antimicrobials from body fluids. 4,174,277, Cl. 210-36.000.

Menche, Eckhard, to Kali und Salz AG. Process for the production of coarse K_2SO_4 in crystallizers and classifiers. 4,174,382, Cl. 423-552.000.

Mercer, Frank B., to Netlon Limited. Tubular plastics material net having corrugations. 4,174,416, Cl. 428-107.000.

Merck & Co., Inc.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,174,316, Cl. 260-239.00A.
McAleer, William J.; and Wasmuth, Edward H., 4,174,388, Cl. 424-86.000.
Mrozik, Helmut, 4,174,400, Cl. 424-273.00B.

Merklinger, Harold M.; and Bluy, Orest Z., to Canada, Her Majesty the Queen in right of. Modular low noise preamplifier. 4,174,503, Cl. 330-300.000.

Merritt, Lauren V.: *See*—
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Messenger, Joseph U., to Mobil Oil Corporation. Technique for controlling lost circulation employing improved soft plug. 4,173,999, Cl. 166-293.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Sardanowsky, Wladimir, 4,174,081, Cl. 244-17.170.

Metallgesellschaft Aktiengesellschaft: *See*—
Holehouse, Stephen L., 4,174,375, Cl. 423-240.000.

Metsugi, Masahiro: *See*—
Watanabe, Sohsuke; and Metsugi, Masahiro, 4,174,067, Cl. 239-112.000.

Meyer, Burton C.; and Hicks, Alan A., to Marvin Glass & Associates. Player actuated flying toy. 4,174,105, Cl. 272-31.00A.

Michael, Uri: *See*—
Schonberger, Eva; Sasson, Zabar; and Michael, Uri, 4,174,446, Cl. 544-313.000.

Michelotti, Francis W.: *See*—
Seidenberger, James W.; and Michelotti, Francis W., 4,174,292, Cl. 252-189.000.

Microwave Development Labs.: *See*—
Young, Paul T. K., 4,174,507, Cl. 333-122.000.

Mielbeck, Roger L.: *See*—
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,173,800, Cl. 4-207.000.

Mielens, Zigurd E., to Sterling Drug Inc. Method for the prophylaxis of SRS-A-induced symptoms. 4,174,402, Cl. 424-274.000.

Milberger, Lionel J., to FMC Corporation. Method and apparatus for interfacing a plurality of control systems for a subsea well. 4,174,000, Cl. 166-362.000.

Miller, Arthur F.: *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,174,354, Cl. 585-626.000.

Miller, Richard G.: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Milne, James: *See*—
Tyrer, Richard G.; and Milne, James, 4,174,412, Cl. 427-297.000.

Min, Tae B.: *See*—
Hardy, William B.; Min, Tae B.; and Hoffman, Joseph A., 4,174,343, Cl. 260-45.75B.

Minagawa, Motonobu: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,174,297, Cl. 252-399.000.

Minegishi, Tomoya; and Takaya, Matsufumi. Black chromium electroplating process. 4,174,265, Cl. 204-51.000.

Minnesota Mining and Manufacturing Company: *See*—
Goettert, Edward J.; and Van Dyke Tiers, George, 4,174,409, Cl. 427-1.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, 4,174,165, Cl. 354-105.000.
Nanba, Yasuhiro; and Yamada, Seiji, 4,174,160, Cl. 354-24.000.
Yamamoto, Toshio; and Yuge, Shizuo, 4,174,170, Cl. 355-3.0TR.
Yamashita, Maki, 4,174,168, Cl. 354-206.000.

Minor, William H.: *See*—
Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., 4,174,181, Cl. 366-2.000.

Mirtain, Henri J., to Uniroyal, Inc. Pneumatic tire with asymmetric reinforcing belt. 4,173,991, Cl. 152-361.0FP.

Mishina, Haruo: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Misunas, David P.; Jessel, Peter G.; and Jacobsen, Robert G., to Massachusetts Institute of Technology. Digital communications controller with firmware control. 4,174,536, Cl. 364-200.000.

Mitchell, George L.: *See*—
Hickey, Robert B., 4,174,107, Cl. 273-29.00A.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Synthetic amorphous silica paraffin hydrogenation-dehydrogenation. 4,174,356, Cl. 585-661.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, 4,174,186, Cl. 405-71.000.
Toki, Naoji, 4,174,185, Cl. 405-27.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, 4,174,211, Cl. 75-0.50B.

Mitsui Petrochemical Industries, Ltd.: *See*—
Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, 4,174,335, Cl. 260-29.6RW.

Mitter, Mathias. Screen printing machine. 4,173,928, Cl. 101-126.000.

Mixan, Craig E., to Dow Chemical Company, The. ((5-Nitro-2-thiazolyl)thio) and ((5-nitro-2-thiazolyl)sulfinyl)pyrazines. 4,174,394, Cl. 424-250.000.

Miyasaka, Kenzi: *See*—
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Mobay Chemical Corporation: *See*—
Sivaramakrishnan, Parameswar; and Baron, Arthur L., 4,174,359, Cl. 260-860.000.

Mobil Oil Corporation: *See*—
Braid, Milton, 4,174,285, Cl. 252-51.50A.
Messenger, Joseph U., 4,173,999, Cl. 166-293.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,174,356, Cl. 585-661.000.
Schwartz, Albert B., 4,174,272, Cl. 208-120.000.
Stournas, Stamoulis, 4,174,309, Cl. 260-13.000.

Moczygemba, George A., to Phillips Petroleum Company. Coupling of alkali metal-terminated polymers. 4,174,360, Cl. 260-880.000.

Mogaki, Katsuo: *See*—
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.

Mohn, Larry W., to Boeing Company, The. Flow deflector for fluid inlet. 4,174,083, Cl. 244-53.00B.

Mohring, Edgar; and Roessler, Peter, to Bayer Aktiengesellschaft. Combating arthropods with substituted triazine-2,4-diones. 4,174,392, Cl. 424-249.000.

Mohring, Edgar; and Roessler, Peter, to Bayer Aktiengesellschaft. Preparation of arthropodicidally active substituted triazine-2,4-diones. 4,174,445, Cl. 544-223.000.

Moldavanov, Viktor P.: *See—*
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.

Moller, Peter: *See—*
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Ries, Karl; Lather, Dieter; and Jannsen, Klaus-Uwe, 4,173,897, Cl. 73-609.000.
Forstermann, Ulrich; Schafer, Hans-Peter; Moller, Peter; Lather, Dieter; Ries, Karl; and Jannsen, Klaus-Uwe, 4,173,898, Cl. 73-611.000.

Momin, Abdulmajid U., to Jaymin Research Corporation. Thermographic diagnostic method and system. 4,173,970, Cl. 128-736.000.

Mongeon, Ronald W., to Stellar Systems, Inc. Intrusion warning system. 4,174,518, Cl. 340-561.000.

Monsanto Company: *See—*
Salame, Morris; and Steingiser, Samuel, 4,174,043, Cl. 215-1.00C.

Montecantini Edison S.p.A.: *See—*
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.

Montedison S.p.A.: *See—*
Bargigia, Gianangelo; Caporiccio, Gerardo; and Carniselli, Giuliano, 4,174,295, Cl. 252-305.000.
Gafa, Salvatore; and Burzio, Fulvio, 4,174,306, Cl. 252-546.000.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.

Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 1-(2,6,6-Trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione and organoleptic uses thereof. 4,174,286, Cl. 252-174.110.

Mookherjee, Braja D.: *See—*
Kamath, Venkatesh; Mookherjee, Braja D.; and Schmitt, Frederick L., 4,174,287, Cl. 252-174.110.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

Moore, Irving, Jr.: *See—*
Wesselski, Fred A.; and Moore, Irving, Jr., 4,174,408, Cl. 426-302.000.

Moran, Steven E., to United States of America, Navy. Ultra high speed gated pulse optical imaging system. 4,174,524, Cl. 358-95.000.

Morgan, Peter D.; and Taig, Alistair G., to Bendix Westinghouse Limited. Vehicle power assisted steering apparatus. 4,174,017, Cl. 180-132.000.

Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, to Hitachi, Ltd. Screw fluid machine. 4,174,196, Cl. 418-9.000.

Morokawa, Shigeru: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Mortensen, J D, to University of Utah. Cannula for arterial and venous bypass cannulation. 4,173,981, Cl. 128-348.000.

Moser, Roland: *See—*
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,174,455, Cl. 560-49.000.

Moser, Willi. Game of skill. 4,174,106, Cl. 273-1.00E.

Mosman, Howard D.: *See—*
Jurva, Edsel O.; and Mosman, Howard D., 4,174,424, Cl. 429-90.000.

Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, to Citizen Watch Company Limited. Analog quartz timepiece. 4,173,863, Cl. 58-85.500.

Motorola, Inc.: *See—*
Wilson, Alan L.; and Backof, Charles A., Jr., 4,174,502, Cl. 329-104.000.

Mrozik, Helmut, to Merck & Co., Inc. Anthelmintic benzimidazoles. 4,174,400, Cl. 424-273.00B.

Mueller, Robert L.: *See—*
United States of America, National Aeronautics and Space Administration; Mueller, Robert L.; and Yasui, Robert K., 4,173,820, Cl. 29-572.000.

Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, to Siemens Aktiengesellschaft. Integrated current supply circuit. 4,174,535, Cl. 363-147.000.

Mulder, Rudolf: *See—*
Van Daalen, Jan J.; and Mulder, Rudolf, 4,174,393, Cl. 424-250.000.

Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, to Bayer Aktiengesellschaft. Novel transparent polyurethane polyureas for lamination of glazing materials. 4,174,240, Cl. 156-99.000.

Munsingwear, Inc.: *See—*
Bloomquist, Lynn M. H.; and Brazil, Robert J., 4,173,976, Cl. 128-159.000.

Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent material. 4,174,294, Cl. 252-301.40P.

Murata Manufacturing Co., Ltd.: *See—*
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,174,421, Cl. 428-432.000.

Murata, Mitsuhiro: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.

Murphy, Donald E.: *See—*
Patel, Pradeep V.; and Murphy, Donald E., 4,174,355, Cl. 585-843.000.

Murtha, Timothy P., to Phillips Petroleum Company. Catalyst for production of cycloalkylaromatics. 4,174,302, Cl. 252-455.00R.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Maltyl-2-methyl alkenoates and novel perfume compositions and perfumed articles containing same. 4,174,288, Cl. 252-174.110.

Myles, Thomas A., to Carborundum Company, The. Refractory moldable composition containing ceramic fiber and colloidal silica. 4,174,331, Cl. 260-29.10R.

Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I. Process for treatment of antimony-containing materials. 4,174,372, Cl. 423-88.000.

Nagahama, Taketoshi: *See—*
Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.

Nagaishi, Hatsuo: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.

Nagase, Tsuneyuki: *See—*
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.

Nagashima, Motoi, to Cima Kogaku Company Limited. Interchangeable lens for cameras. 4,174,167, Cl. 354-196.000.

Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi. Booster circuit for electronic timepiece. 4,173,862, Cl. 58-23.0BA.

Nakahara, Yasuhiro: *See—*
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.

Nakahara, Yutaka: *See—*
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,174,297, Cl. 252-399.000.

Nakamura, Satoshi; Ikushima, Ichiro; Sasaki, Yoshimitsu; Chiba, Katuaki; and Ito, Ryoichi, to Hitachi, Ltd. Mount for a light emitting device. 4,174,491, Cl. 313-499.000.

Nakamura, Shigeo: *See—*
Sakamoto, Teruhisa; Nagahama, Taketoshi; Nakamura, Shigeo; and Kihara, Keiichi, 4,174,459, Cl. 562-534.000.

Nakamura, Souichirou: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.

Nakane, Hisashi: *See—*
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.

Nakano, Tatsuo; Hori, Shozo; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Hardenable composition containing diisopropylbenzene dihydroperoxide. 4,174,311, Cl. 260-28.50R.

Nakase, Takamichi: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.

Nakata, Tetsuya: *See—*
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.

Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., to Eli Lilly and Company. Deoxynarasin antibiotics. 4,174,404, Cl. 424-283.000.

Nakayama, Shinpei: *See—*
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,174,425, Cl. 521-56.000.

Nakazumi, Tadataka, to Toyo Kogyo Co., Ltd. Exhaust gas recirculation apparatus controlled by clutch, throttle and timer. 4,174,027, Cl. 192-0.084.

Nalco Chemical Company: *See—*
Choca, Monica E.; and Feistel, Gerald R., 4,174,301, Cl. 252-455.00R.

Nanba, Yasuhiro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Programmed automatic exposure control circuitry. 4,174,160, Cl. 354-24.000.

Natico, Inc.: *See—*
Ralston, George D., 4,174,246, Cl. 156-391.000.

National Hand Tool Corporation: *See—*
Chow, Kirk K., 4,174,037, Cl. 206-378.000.

National Research Development Corporation: *See—*
Dell, Christopher C., 4,174,281, Cl. 210-83.000.
Franks, Albert, 4,174,478, Cl. 250-276.000.

Natori, Minoru: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.

Naturin-Werk Becker & Co.: *See—*
Korlatzki, Rudi; and Schumacher, Gunter, 4,174,436, Cl. 528-80.000.

Neale, Ronald G., to Harris Corporation. PROM electrically written by solid phase epitaxy. 4,174,521, Cl. 357-45.000.
Neilson, Robert M., Jr.: *See—*
Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., 4,174,293, Cl. 252-301.10W.
Nelimarkka, Juha A. E. Ball valve with spindle, having parallelepiped-bearing block joint portions. 4,174,090, Cl. 251-86.000.
Nelli, Giuseppe: *See—*
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.
Nelson, Beckay J.: *See—*
Tolley, William K.; and Nelson, Beckay J., 4,174,274, Cl. 209-166.000.
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I. Method of manufacturing tangential expanders for oil control piston rings. 4,173,878, Cl. 72-137.000.
Netlon Limited: *See—*
Mercer, Frank B., 4,174,416, Cl. 428-107.000.
Neuss, Norbert: *See—*
Nakatsukasa, Walter M.; Marconi, Gary G.; Neuss, Norbert; and Hamill, Robert L., 4,174,404, Cl. 424-283.000.
NFE International Ltd.: *See—*
Dupre, George T.; and DeMarco, Thomas M., 4,174,206, Cl. 55-434.000.
NGK Insulators, Ltd.: *See—*
Kawaguchi, Toshiyuki; and Hayashi, Tomio, 4,174,464, Cl. 174-212.000.
Nichols, Richard D. E., to Bianchi Leather Products, Inc. Buckleless belt. 4,173,794, Cl. 2-322.000.
Nicholson, Barrie F. Hole cutter having rotatable blade carrier. 4,173,913, Cl. 83-555.000.
Nicol, Charles H.: *See—*
Burns, Michael E.; and Nicol, Charles H., 4,174,305, Cl. 252-545.000.
Nienart, Louis F., to Allied Chemical Corporation. Stabilized magnetic shields. 4,174,419, Cl. 428-313.000.
Nihon Repro Machine Kogyo Kabushiki Kaisha: *See—*
Kinoshita, Tomoo, 4,174,198, Cl. 425-135.000.
Niida, Chiaki: *See—*
Yamada, Kinsaku; Niida, Chiaki; and Takayama, Teruo, 4,173,955, Cl. 123-119.00A.
Ning, Tak H.: *See—*
Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., 4,173,818, Cl. 29-571.000.
Nippon Electric Co., Ltd.: *See—*
Ogawa, Hiroshi, 4,174,506, Cl. 333-1.100.
Nippon Kogaku K. K.: *See—*
Shio, Megumu, 4,173,902, Cl. 74-10.520.
Nippon Kogaku K.K.: *See—*
Daitoku, Kouichi; and Takahata, Kouichi, deceased, 4,174,166, Cl. 354-173.000.
Nippon Oil Company, Limited: *See—*
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Takata, Akira; Fukuda, Tamotsu; and Nakase, Takamichi, 4,173,957, Cl. 123-119.0EC.
Nishihara, Motohisa: *See—*
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide and method for making same. 4,174,421, Cl. 428-432.000.
Nissan Motor Company, Limited: *See—*
Asano, Masaharu, 4,173,952, Cl. 123-32.0EE.
Hagiwara, Yutaca, 4,174,024, Cl. 188-1.00A.
Ikeura, Kenji; Saito, Masaaki; and Yamane, Michiyoshi, 4,173,956, Cl. 123-119.0EC.
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.
Niznik, George E., to General Electric Company. Flame retardant rigid thermoplastic foams. 4,174,432, Cl. 521-180.000.
Noguchi, Tatsuhiko: *See—*
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.
Norlin Industries, Inc.: *See—*
Gross, Glenn M., 4,173,915, Cl. 84-1.190.
Norris, Alan H.; and Chambley, Phillip W., to WWG Industries, Inc. Method and apparatus for controlling twist in yarn. 4,173,861, Cl. 57-293.000.
North American Philips Corporation: *See—*
Soden, George B.; Parikh, Hasit H.; and Kavanaugh, Richard J., 4,174,485, Cl. 310-89.000.
Northern Telecom Limited: *See—*
Kotlarewsky, Paul, 4,174,534, Cl. 363-26.000.
Nouvertne, Werner: *See—*
Idel, Karsten; Freitag, Dieter; and Nouvertne, Werner, 4,174,437, Cl. 528-199.000.
Novello Fratelli S.p.A: *See—*
Novello, Renzo; and Bottussi, Elvio, 4,174,007, Cl. 144-1.00R.
Novello, Renzo; and Bottussi, Elvio, to Novello Fratelli S.p.A. Machine for the production of shaped parts. 4,174,007, Cl. 144-1.00R.
Nudenberg, Walter: *See—*
Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., 4,174,457, Cl. 560-134.000.
Nudyne Corporation: *See—*
Schaefer, Kenneth A., 4,173,876, Cl. 72-83.000.
Oberkirch, Wolfgang: *See—*
Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,174,240, Cl. 156-99.000.
Obezag Design and Development Corporation: *See—*
Raptoplous, Harry C., 4,173,855, Cl. 52-82.000.
Obuch, Edward A.; and Filak, Paul T., to Amerace Corporation. Electrical terminal clamp assembly. 4,174,148, Cl. 339-246.000.
Odis, Johnnie M. Urine bag cover and holder device. 4,173,979, Cl. 128-295.000.
Oeschger, Joseph E.; and Berkeland, James E., to United States of America, Energy. High pressure electrical insulated feed thru connector. 4,174,145, Cl. 339-94.00A.
Ogawa, Hiroshi, to Nippon Electric Co., Ltd. Three-port lumped-element circulator comprising bypass conductors. 4,174,506, Cl. 333-1.100.
Ogawa, Hiroshi: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.
Ogawa, Toshio: *See—*
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,174,421, Cl. 428-432.000.
Ogino, Shigeo: *See—*
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.
Oguchi, Toshiaki: *See—*
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.
Ohara, Katsunobu: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 4,174,215, Cl. 430-68.000.
Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, to Mitsui Petrochemical Industries, Ltd. Aqueous dispersions of olefinic resin compositions and process for preparation thereof. 4,174,335, Cl. 260-29.6RW.
Ohkubo, Masae: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.
Ohloff, Gunther: *See—*
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Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for manufacturing composite powder for powder metallurgy. 4,174,211, Cl. 75-0.50B.
Ohta, Minoru: *See—*
Seki, Sigeru; Noguchi, Tatsuhiko; Ohta, Minoru; and Kurita, Ryuichi, 4,174,224, Cl. 106-38.300.
Ohta, Yoshiharu: *See—*
Hohda, Takeo; Tominaga, Shinji; and Ohta, Yoshiharu, 4,174,165, Cl. 354-105.000.
Oi, Nakao; Shibata, Tadayoshi; and Goto, Toshio. Film unit processing means. 4,174,163, Cl. 354-86.000.
Okazaki, Noboru: *See—*
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asaumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.
Okuda Koki Co., Ltd.: *See—*
Takama, Teruhiro, 4,173,896, Cl. 73-518.000.
Olin Corporation: *See—*
Ralston, Richard W., Jr., 4,174,267, Cl. 204-99.000.
Saeman, Walter C.; Coe, Noel N.; and Faust, John P., 4,174,411, Cl. 427-214.000.
Olympus Optical Co., Ltd.: *See—*
Fujiwara, Toshihide; Kaneko, Nobutaka; and Fujimori, Ryo, 4,173,943, Cl. 118-718.000.
Kusuyama, Michio, 4,174,469, Cl. 179-121.00D.
Ouchi, Teruo; and Kato, Yutaka, 4,174,178, Cl. 356-39.000.
Yamada, Hiroyuki, 4,174,080, Cl. 242-199.000.
Yonekubo, Ken, 4,174,151, Cl. 350-175.0ML.
Oniki, Tetsuya: *See—*
Kato, Yuzo; Ii, Akira; and Oniki, Tetsuya, 4,173,958, Cl. 123-136.000.
Onodera, Kinich: *See—*
Ohdaira, Akio; Tomoshige, Toru; and Onodera, Kinich, 4,174,335, Cl. 260-29.6RW.
Ooka, Mituo: *See—*
Motoki, Jinro; Ichikawa, Singo; Miyasaka, Kenzi; Uematsu, Hiroyuki; Murata, Mitsuhiro; Kawashima, Hideyuki; Inoue, Yuri; Ohkubo, Masae; and Ooka, Mituo, 4,173,863, Cl. 58-85.500.
Osaka Soda Co. Ltd.: *See—*
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.
Osburn, Carlton M.: *See—*
Bassous, Ernest; Ning, Tak H.; and Osburn, Carlton M., 4,173,818, Cl. 29-571.000.
Osipow, Lloyd I.: *See—*
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,174,386, Cl. 424-47.000.

Otani, Mitsuoki: *See*—
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.
Otness, Leslie. Household grain cleaner. 4,174,276, Cl. 209-250.000.
Ouchi, Teruo; and Kato, Yutaka, to Olympus Optical Co., Ltd. Blood serum bearing film with position indicating mark. 4,174,178, Cl. 356-39.000.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines. 4,174,370, Cl. 422-12.000.
Outboard Marine Corporation: *See*—
Strang, Charles D., 4,173,939, Cl. 115-17.000.
Owens-Illinois, Inc.: *See*—
Boling, Norman L.; and Fein, Michael E., 4,174,476, Cl. 219-121.00L.
Owens, Walter K., to 3-in-1, Inc. Vending machine for newspapers and the like. 4,174,047, Cl. 221-154.000.
Padovese, Aldo A.; Trevisan, Giuseppe M. B.; and Sitar, Emilio C., to Robert Bosch GmbH. Inductive ignition control pulse generator in an internal combustion engine distributor. 4,173,960, Cl. 123-146.50A.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. Alkylidenylmethyl-substituted 1-sulfonylbenzimidazoles. 4,174,454, Cl. 548-306.000.
Pahl, Karl-Heinz, to Pahl'sche Gummi—und Asbest-Gesellschaft "PAGUAG". Continuous method for making hoses with destruction of horizontally disposed mandrel. 4,174,365, Cl. 264-146.000.
Pahl'sche Gummi—und Asbest-Gesellschaft "PAGUAG": *See*—
Pahl, Karl-Heinz, 4,174,365, Cl. 264-146.000.
Pako Corporation: *See*—
Melander, Theodore A.; and Charnley, Ralph L., 4,174,169, Cl. 354-324.000.
Pone, John, Jr., 4,174,173, Cl. 355-38.000.
Palletower Limited: *See*—
Atkins, George T. N., 4,174,046, Cl. 220-6.000.
Pampouchidis, Georgios: *See*—
Honig, Helmut; and Pampouchidis, Georgios, 4,174,332, Cl. 260-29.2TN.
Panavision, Incorporated: *See*—
Gottschalk, Robert E., 4,174,157, Cl. 352-35.000.
Panneman, Hendrik, to U.S. Philips Corporation. Filtering device. 4,174,006, Cl. 141-87.000.
Papalardo, William A. Nutcracker. 4,173,825, Cl. 30-120.300.
Paper Converting Machine Company: *See*—
Charles, Richard J., 4,174,077, Cl. 242-68.600.
Steiner, Gary F.; and Campbell, James F., 4,173,846, Cl. 51-248.000.
Papke, Friedrich; and Scholz, Erwin, to Rollei-Werke Franke & Heidecke. Crank drive for a photographic camera. 4,173,903, Cl. 74-47.000.
Papst-Motoren KG: *See*—
Schmider, Fritz, 4,174,484, Cl. 310-68.00R.
Parcor: *See*—
Bousquet, Andre; and Braye, Emile, 4,174,448, Cl. 546-114.000.
Parikh, Hasit H.: *See*—
Soden, George B.; Parikh, Hasit H.; and Kavanaugh, Richard J., 4,174,485, Cl. 310-89.000.
Parisien, Rudolph E. Boat dock. 4,174,187, Cl. 405-221.000.
Parodi, Sandro: *See*—
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.
Parsons, Ronald. Double walled rotary tubular conveyor. 4,174,033, Cl. 198-804.000.
Parygin, Veniamin A.: *See*—
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.
Paschke, Klaus, to ITT Industries, Inc. Method of selective gas etching on a silicon nitride layer. 4,174,251, Cl. 156-643.000.
Patel, Pradeep V.; and Murphy, Donald E., to B. F. Goodrich Company, The. Process for removing α-acetylenes from diolefins. 4,174,355, Cl. 585-843.000.
Patterson, James A. Water level controller for swimming pool gutter. 4,173,799, Cl. 4-172.170.
Paul, Volker: *See*—
Regel, Erik; Frohberger, Paul-Ernst; and Paul, Volker, 4,174,398, Cl. 424-270.000.
Paurat, Friedrich W. Condition responsive trench excavator. 4,173,836, Cl. 37-81.000.
Paustian, John E.: *See*—
Gelbein, Abraham P.; Paustian, John E.; and Fanelli, Anthony J., 4,174,452, Cl. 546-319.000.
Pearce, Michael L. Induction furnaces for high temperature continuous melting applications. 4,174,462, Cl. 13-26.000.
Pease, James F.: *See*—
Meckstroth, Alan F.; and Pease, James F., 4,173,816, Cl. 29-526.00R.
Peco Limited: *See*—
Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, 4,173,859, Cl. 56-330.000.
Pecor, Lloyd A. Apparatus for and method of sampling liquid oxygen. 4,173,895, Cl. 73-421.50R.
Peeters, Jozef C. I., to U.S. Philips Corporation. Mirror condenser lamp. 4,174,487, Cl. 313-113.000.
Peinado, Fernando Rabadan: *See*—
Jargue, Ricardo Granados; Domingo, Mercedes Alvarez; Cartes, Juan Bosch; Roldan, Cirstobal Martinez; and Peinado, Fernando Rabadan, 4,174,396, Cl. 424-256.000.
Jarque, Ricardo Granados; Cartes, Juan Bosch; Jimenez, Rosa Llobera; Roldan, Cristobal Martinez; and Peinado, Fernando Rabadan, 4,174,451, Cl. 546-283.000.
Pellegrino, Peter P. Apparatus for electroplating, deplating or etching. 4,174,261, Cl. 204-273.000.
Pennwalt Corporation: *See*—
Kulischenko, Walter; and Capdevielle, Martin J., 4,173,937, Cl. 114-144.00R.
Pentland, Alex M.: *See*—
Jaseck, James E.; and Pentland, Alex M., 4,173,901, Cl. 74-6.000.
Perdijon, Jean, to Commissariat a l'Energie Atomique. Method and device for scanning by means of a focused ultrasonic beam. 4,173,899, Cl. 73-620.000.
Permawick Company, Inc.: *See*—
Abel, Martin L., 4,174,139, Cl. 308-125.000.
Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., to Continental Group, Inc., The. Brush mounting for rotary electrical joint. 4,174,142, Cl. 339-5.00R.
Peterson, Donald J.: *See*—
Betlejewski, Frank W.; and Peterson, Donald J., 4,174,158, Cl. 353-113.000.
Petit, Leon; Davin, Andre; and Gueguen, Jacques, to Institut National de la Recherche Agronomique. Purified sunflower seed protein isolates. 4,174,313, Cl. 260-123.500.
Petracca, Victor G.: *See*—
Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.
Petrolite Corporation: *See*—
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,174,370, Cl. 422-12.000.
Pfeffer, Paul, to Etablissements Carpano & Pons. Electric motors control system. 4,174,494, Cl. 318-54.000.
Philibert, Daniel. Vibratory cleaner for endless belt conveyor. 4,174,030, Cl. 198-494.000.
Phillips Petroleum Company: *See*—
Borel, Albert W.; and Baldwin, Bernard A., 4,174,284, Cl. 252-48.600.
Carroll, James C.; and Shafer, Clel H., 4,174,248, Cl. 156-538.000.
Chapman, Charles C., 4,174,357, Cl. 585-701.000.
Moczygemba, George A., 4,174,360, Cl. 260-880.000.
Murtha, Timothy P., 4,174,302, Cl. 252-455.00R.
Pierce, Linden W., to General Electric Company. Heat exchanger arrangement for vaporization cooled transformers. 4,173,996, Cl. 165-105.000.
Piersall, Raymond. Roof bolt and the like. 4,173,918, Cl. 85-75.000.
Piesik, Edward T., to General Dynamics Corporation. Two-way rocket plenum for combustion suppression. 4,173,919, Cl. 89-1.800.
Pipeline Seal and Insulation Co. Ltd.: *See*—
Dockree, Basil F., 4,174,124, Cl. 285-54.000.
Pirinoli, Franco: *See*—
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,299, Cl. 252-429.00B.
Giannini, Umberto; Albizzati, Enrico; Parodi, Sandro; and Pirinoli, Franco, 4,174,429, Cl. 526-114.000.
Pischtschan, Alfred; Adelmann, Siegfried; and Margotte, Dieter, to Bayer Aktiengesellschaft. Thermoplastic ABS moulding compositions with improved impact strength. 4,174,325, Cl. 260-32.10N.
Pizarek, Patrick J.: *See*—
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,173,800, Cl. 4-207.000.
Plattner, Robert F., to Bastian Blessing Company, Inc. Pizza making machine. 4,173,942, Cl. 118-25.000.
Plesset, Richard: *See*—
McFall, William A.; White, Stanley A.; Lane, Howard K.; Butcher, Daryl T.; Anderson, Donald V., Jr.; McCollum, Patrick E.; Kirk, James F.; and Plesset, Richard, 4,174,496, Cl. 323-9.000.
Ploeger, Marinus: *See*—
Van Erk, Klaus C.; Ploeger, Marinus; and Von Reth, Peter H., 4,174,490, Cl. 313-480.000.
Pocholle, Bernard, to Robert Bosch GmbH. Fuel injection pulse suppressor apparatus. 4,173,953, Cl. 123-32.0EL.
Pohl, Rudolph L., to Hercules Incorporated. Relief plates from polymer with terminal unsaturation. 4,174,218, Cl. 430-306.000.
Polaroid Corporation: *See*—
Friedman, Harvey S.; and Lippert, Irving S., 4,174,164, Cl. 354-86.000.
Idelson, Elbert M., 4,174,221, Cl. 430-225.000.
Poli, Pierre R., to Electronique Marcel Dassault. Method for the improved utilization of response signals in a secondary radar system and a secondary radar system for implementing the method. 4,174,519, Cl. 343-6.50R.
Polychrome Corporation: *See*—
Rowe, William, 4,174,307, Cl. 204-159.190.
Pomper, Michael: *See*—
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Pone, John, Jr., to Pako Corporation. Photographic printer with interactive color balancing. 4,174,173, Cl. 355-38.000.
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Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury

V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Porat, David. Detachable paper bag carrier. 4,174,060, Cl. 224-45.00H.

Porter, Donald H.: *See—*
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Postel, Michel: *See—*
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Potter, James C.: *See—*
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PPG Industries, Inc.: *See—*
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Boberski, William G.; Chang, Wen-Hsuan; and Seiner, Jerome A., 4,174,228, Cl. 106-107.000.
Boberski, William G.; Chang, Wen-Hsuan; Petracca, Victor G.; and Seiner, Jerome A., 4,174,229, Cl. 106-107.000.
Carlin, William W.; and Dahlberg, Lois A., 4,174,269, Cl. 204-129.950.
Gagne, Robert, 4,174,207, Cl. 65-99.00A.
Hartman, Marvis E.; and Hockswender, Thomas R., 4,174,333, Cl. 260-29.2EP.
Jeffery, Thomas C., 4,174,266, Cl. 204-98.000.
Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., 4,174,241, Cl. 156-102.000.
Tolliver, Richard J., 4,174,076, Cl. 242-56.00B.

Pradt, Louis A.; and Gitchel, Wayne B., to Sterling Drug Inc. Oxidation process. 4,174,280, Cl. 210-60.000.

Praehauser, Georg: *See—*
Schiessl, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, 4,173,931, Cl. 102-90.000.

Pratt, Fred, Jr., to Teleci, Inc. Energy control system providing selective control of remote zone heating or cooling from a central location. 4,174,064, Cl. 236-1.00B.

Preformed Line Products Company: *See—*
Albert, Frank, Jr., 4,174,463, Cl. 174-79.000.

Preikschat, Fritz K. Apparatus and method for providing separate conductivity, dielectric coefficient, and moisture measurements of particulate material. 4,174,498, Cl. 324-57.00R.

Premier Drum Company Limited, The: *See—*
Della-Porta, Clifford A., 4,173,917, Cl. 84-419.000.

Prest, J. David. Prest-O-Fit universal adapter fitting. 4,173,989, Cl. 138-109.000.

Preziosi, Joseph R.; and Trimmer, Paul A., to Amerace Corporation. Access panel fastener retainer. 4,174,008, Cl. 151-69.000.

Pro Sharp Corporation: *See—*
Aksamit, Frank J., 4,173,908, Cl. 76-25.00A.

Procter & Gamble Company, The: *See—*
Benjamin, Lawrence; Saylor, Jay H.; and Uchtman, Vernon A., 4,174,291, Cl. 252-156.000.
Burns, Michael E.; and Nicol, Charles H., 4,174,305, Cl. 252-545.000.
Garrison, Charles M., 4,174,314, Cl. 260-123.500.
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,174,315, Cl. 260-123.500.

Pugh, Emerson W.: *See—*
Cohen, Mitchell S.; and Pugh, Emerson W., 4,174,540, Cl. 365-15.000.

Pullman Incorporated: *See—*
Snook, Randolph W., 4,173,923, Cl. 98-58.000.

PUMA-Sportschuhfabriken Rudolf Dassler KG: *See—*
Benseler, Hans, 4,174,121, Cl. 280-615.000.

Querry, Lester R., to Digital Communications Corporation. Directional PSK modulation and demodulation system. 4,174,505, Cl. 332-9.00R.

Quirijnen, Marius: *See—*
Van Kempen, Dick; and Quirijnen, Marius, 4,173,927, Cl. 101-93.030.

Quiring, Bernd: *See—*
Muller, Hanns P.; Oberkirch, Wolfgang; Wagner, Kuno; and Quiring, Bernd, 4,174,240, Cl. 156-99.000.

Rabus, Friedrich; and Grather, Gunter, to Robert Bosch GmbH. Ignition system with essentially constant ignition coil energy supply. 4,173,962, Cl. 123-148.00E.

Rahman, Michael, to Envirotech Corporation. Humidifer. 4,174,362, Cl. 261-90.000.

Ralston, George D., to Natico, Inc. Hand taping device. 4,174,246, Cl. 156-391.000.

Ralston, Richard W., Jr., to Olin Corporation. Method for detecting incipient short circuits in electrolytic cells. 4,174,267, Cl. 204-99.000.

Rampin, Pierre: *See—*
Forster, Michel; and Rampin, Pierre, 4,173,889, Cl. 73-194.00A.

Ramsbottom, Edgar; Whalley, William; and Bale, Edmund, to Chloride Group Limited. Electric storage batteries. 4,174,004, Cl. 141-32.000.

Raptoplous, Harry C., to Obezag Design and Development Corporation. Prefabricated building frame structure. 4,173,855, Cl. 52-82.000.

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Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Apparatus for automatically centering an endless band trained over two rolls. 4,173,904, Cl. 74-241.000.

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Reynolds, David W.: *See—*
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Rockar, Paul A.; Law, Melvin K.; and Hawk, Thomas W., to PPG Industries, Inc. Simultaneously laminating and press polishing plastic laminated transparencies. 4,174,241, Cl. 156-102.000.

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Rosenblatt, Martin. PsychologicaL game. 4,173,833, Cl. 35-22.00R.

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Rucker, John T.; and Porter, Donald H., to Hooker Chemicals & Plastics Corp. Electrolytic cell structure and method of assembly. 4,174,259, Cl. 204-252.000.

Rudolph, Robert L. Gun having disposable cartridge. 4,174,068, Cl. 239-322.000.

Rupp, James A., to United States of America, Army. Secure fiber optics communication system. 4,174,149, Cl. 350-96.330.

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Saeman, Walter C.; Coe, Noel N.; and Faust, John P., to Olin Corporation. Granular calcium hypochlorite coated with an inorganic salt by spray graining. 4,174,411, Cl. 427-214.000.

Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, to Sekisui Kasehin Kogyo Kabushiki Kaisha; and Sekisui Kagaku Kogyo Kabushiki Kaisha. Process of preparing styrenic polymer foams. 4,174,425, Cl. 521-56.000.

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Sakakibara, Kinsaku, to Senko Medical Instrument Mfg. Co., Ltd. Peristatic pump with hose positioning means and pressure adjustment apparatus. 4,174,193, Cl. 417-477.000.

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Scarpellino, Anthony J., Jr., to International Nickel Company, Inc., The. Iridium compound and preparation thereof. 4,174,378, Cl. 423-386.000.

Schaefer, Kenneth A., to Nudyne Corporation. Method of producing metal tubing. 4,173,876, Cl. 72-83.000.

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Schaefer, Peter; and Doerre, Wolfgang, to ITT Industries, Inc. Vehicle seat. 4,174,088, Cl. 248-395.000.

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Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Polyhydroxyl compounds containing guanidine groups useful in preparation of polyurethane foams. 4,174,433, Cl. 528-49.000.

Schafer, Walter; Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Polyhydroxyl compounds containing phosphonoformamidine groups prepared from diisocyanatocarbodiimides, polyhydroxyl compounds and a phosphite. 4,174,435, Cl. 528-70.000.

Scharen, Richard O. Self-contained heating apparatus. 4,173,966, Cl. 126-121.000.

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Schiesal, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, to BUCK Chemisch-Technische Werke GmbH. & Co., Firma. Incendiary warhead. 4,173,931, Cl. 102-90.000.

Schinski, William L.; Huang, Irene C.; and Chan, David C. K., to Chevron Research Company. Herbicidal and plant-growth regulating N-haloacetylphenylamino carbonyl oximes. 4,174,210, Cl. 71-118.000.

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Seymour, James E., to Royster Company. Process for manufacturing potassium polyphosphate. 4,174,376, Cl. 423-315.000.
Shafer, Clel H.: *See*—
Carroll, James C.; and Shafer, Clel H., 4,174,248, Cl. 156-538.000.
Shaforenko, Mark A.: *See*—
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.
Sharp, Michael R. G.: *See*—
Archbold, Thomas; and Sharp, Michael R. G., 4,173,886, Cl. 73-23.000.
Sharp, Richard S.: *See*—
Chu, Ke-Chiang; and Sharp, Richard S., 4,174,537, Cl. 364-200.000.
Shaw, Arthur G.: *See*—
Garbelman, David L.; Minor, William H.; and Shaw, Arthur G., 4,174,181, Cl. 366-2.000.
Shaw, Wilfrid G.: *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,174,354, Cl. 585-626.000.
Shearer, Thomas R., to Kennametal Inc. Gripper jaw. 4,174,093, Cl. 254-29.00R.
Shell Internationale Research Maatschappij B. V.: *See*—
Kramer, Petrus A.; and Austermuhle-Bertola, Helena, 4,174,348, Cl. 260-464.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Austermuhle-Bertola, Helena, 4,174,347, Cl. 260-465.400.
Shibata, Tadayoshi: *See*—
Oi, Nakao; Shibata, Tadayoshi; and Goto, Toshio, 4,174,163, Cl. 354-86.000.
Shiho, Shinho: *See*—
Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, 4,174,230, Cl. 106-109.000.
Shimada, Satoshi: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.
Shimazaki, Toshikazu: *See*—
Nakagiri, Tadahiko; Daigo, Kunihiro; Oguchi, Toshiaki; Hatuse, Toshikazu; Shimazaki, Toshikazu; Morokawa, Shigeru; Natori, Minoru; and Ogawa, Hiroshi, 4,173,862, Cl. 58-23.0BA.
Shimazoe, Michitaka: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Shimizu, Akihiko: *See*—
Asami, Shunichi; Seita, Toru; and Shimizu, Akihiko, 4,174,426, Cl. 521-27.000.

Shimizu, Masahiro, to Zojirushi Vacuume Bottle Co., Ltd. Vacuum bottle having a tilt responsive closure. 4,174,053, Cl. 222-209.000.

Shin-Shirasuna Electric Corp.: *See*—
Hayashi, Kiyoshi, 4,174,079, Cl. 242-186.000.

Shio, Megumu, to Nippon Kogaku K. K. Single-axis coarse and fine adjustment device provided with medium adjustment. 4,173,902, Cl. 74-10.520.

Shmuelzon, Elka I.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Shoffner, James P., to UOP Inc. Separation of dissimilar amines. 4,174,351, Cl. 260-582.000.

Shukla, Jayendra G.: *See*—
Smith, Ray E.; and Shukla, Jayendra G., 4,174,328, Cl. 260-17.4CL.

Shuklin, Anatoly M.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

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Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 42?-88.000.

Shuster, Edward J.: *See*—
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., 4,173,982, Cl. 131-9.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,174,288, Cl. 252-174.110.

Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, to Montecantini Edison S.p.A. Stabilized perfluoropolyether fluids. 4,174,461, Cl. 568-582.000.

Siemens Aktiengesellschaft: *See*—
Heuwieser, Erwin; Scianna, Cosimo; and Wetzel, Klaus, 4,173,963, Cl. 123-149.00D.
Holle, Johannes, 4,174,492, Cl. 315-39.000.
Liebetruth, Reiner, 4,174,481, Cl. 250-445.00T.
Mueller, Ruediger; Pomper, Michael; and Leipold, Ludwig, 4,174,535, Cl. 363-147.000.
Windele, Josef, 4,174,176, Cl. 355-110.000.

Sigman, John J., Jr., to Lear Siegler, Inc. Plunge shaving machine. 4,173,920, Cl. 409-37.000.

Sih, John C.: *See*—
Johnson, Roy A.; and Sih, John C., 4,174,441, Cl. 542-426.000.

Silcock, Gordon H. Brushes. 4,173,805, Cl. 15-97.00B.

Simpson, Benny E., to Dow Chemical Company, The. Kit and method for testing liquids for hydrogen sulfide content. 4,174,202, Cl. 23-230.00R.

Simpson, Francis M., Jr.: *See*—
Baker, Ralph C.; Ellis, Larry E.; and Simpson, Francis M., Jr., 4,174,098, Cl. 267-8.00R.

Simpson, Robert D.: *See*—
Meares, Lawrence G.; and Simpson, Robert D., 4,174,465, Cl. 179-15.00A.

Sinclair International Bar Services Limited: *See*—
Emery, John A., 4,174,057, Cl. 222-332.000.

Sitar, Emilio C.: *See*—
Padovese, Aldo A.; Trevisan, Giuseppe M. B.; and Sitar, Emilio C., 4,173,960, Cl. 123-146.50A.

Sivaramakrishnan, Parameswar; and Baron, Arthur L., to Mobay Chemical Corporation. Flame retardant polycarbonate polyblends. 4,174,359, Cl. 260-860.000.

Skachkov, Jury V.: *See*—
Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,174,483, Cl. 310-52.000.

Skala, Stephen F. Domestic appliance system with thermal exchange fluid. 4,173,993, Cl. 165-48.00R.

SKF Nova AB: *See*—
Lundgren, Bengt, 4,173,907, Cl. 74-459.000.

Skorianetz, Werner: *See*—
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,174,327, Cl. 260-346.110.

Slosiarek, Michael L.; and Krieger, Gregory A., to Allis-Chalmers Corporation. Isolated step support. 4,174,116, Cl. 280-163.000.

Slosiarek, Michael L., to Allis-Chalmers Corporation. Isolated step support. 4,174,117, Cl. 280-163.000.

Small, Marvin: *See*—
Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C., 4,174,386, Cl. 424-47.000.

Smith, Frank, to Imperial Chemical Industries Limited. Coating and bonding of metals. 4,174,410, Cl. 427-57.000.

Smith, James L.; Helenberg, Harold W.; and Kilsdonk, Dennis J., to United States of America, Energy. RF transformer. 4,174,510, Cl. 336-62.000.

Smith, Ray E.; and Shukla, Jayendra G., to Velsicol Chemical Corporation. Flame retarded non-woven textile material comprised of flame retardant and vinyl chloride latex. 4,174,328, Cl. 260-17.4CL.

SmithKline Corporation: *See*—
Berges, David A., 4,174,323, Cl. 548-251.000.
Berges, David A., 4,174,324, Cl. 548-264.000.

Snook, Randolph W., to Pullman Incorporated. Metal and brick chimney liner. 4,173,923, Cl. 98-58.000.

Snyder, W. Henry. Orchard lifts. 4,174,022, Cl. 182-145.000.

S.p.A. Luigi Rizzi & C.: *See*—
Repetto, Silvio, 4,173,904, Cl. 74-241.000.

Societe Civile de Recherches et d'Applications Scientifiques: *See*—
Beguin, Alain, 4,174,395, Cl. 424-251.000.

Societe Franceo-Americaine de Constructions Atomiques-Framatome: *See*—
Vignes, Alain, 4,174,233, Cl. 148-4.000.

Societe Generale de Techniques et d'Etudes: *See*—
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Tramier, Bernard; and Guillerme, Michel, 4,174,278, Cl. 210-51.000.

Soden, George B.; Parikh, Hasit H.; and Kavanaugh, Richard J., to North American Philips Corporation. Electric motor with novel stator construction. 4,174,485, Cl. 310-89.000.

Solomon, Donald F., to S/P Product Design, Inc. Pneumatic amplifier. 4,173,984, Cl. 137-119.000.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, to Sulzer Morat GmbH. Apparatus on a textile machine for feeding yarn, sliver or fibrous materials. 4,173,873, Cl. 66-125.00R.

Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, to Sulzer Morat GmbH. Apparatus on a textile machine for the feeding of yarns, slivers or other fibrillar materials. 4,173,874, Cl. 66-125.00R.

Sorgenfrei, Malachi E.; and Garvin, Donald F., to BASF Wyandotte Corporation. Liquid detergent-bleach concentrates having high alkalinity. 4,174,289, Cl. 252-103.000.

Sorimachi, Kanehiro: *See*—
Mashimo, Yukio; Uchiyama, Takashi; and Sorimachi, Kanehiro, 4,174,161, Cl. 354-33.000.

Sosnowski, Stanislaw J. A.; and Potter, James C., to Lucas Industries Limited. Liquid fuel injection pumps. 4,173,959, Cl. 123-139.0AP.

Spain, Raymond G.: *See*—
Langlois, Guy B.; and Spain, Raymond G., 4,173,990, Cl. 139-440.000.

Spak, Mark A.: *See*—
Kressel, Henry; and Spak, Mark A., 4,174,252, Cl. 156-653.000.

Spanier, Hermann, to Dr. Boy K.G. Endswitch cam arrangement. 4,174,474, Cl. 200-331.000.

Sparkomatic Corporation: *See*—
Castagna, John F., 4,173,941, Cl. 116-307.000.

Speckhart, Frank H. Limited rotation roller tappet. 4,173,954, Cl. 123-90.500.

Speedshelf International, Inc.: *See*—
Searby, Dennis deB., 4,173,934, Cl. 108-111.000.

Sperry Rand Corporation: *See*—
Kline, Charles M., 4,174,072, Cl. 241-35.000.

Spie-Batignolles: *See*—
Cros, Pierre; Desorbay, Jean-Pierre; and Refoubelet, Jean-Jacques, 4,174,273, Cl. 208-364.000.

Spitzer, Joseph G.; Osipow, Lloyd I.; Small, Marvin; and Marra, Dorothea C. Aerosol antiperspirant compositions with good adherence to the skin. 4,174,386, Cl. 424-47.000.

Sprecker, Mark A.: *See*—
Hall, John B.; Sprecker, Mark A.; Shuster, Edward J.; Schmitt, Frederick L.; and Vinals, Joaquin F., 4,173,982, Cl. 131-9.000.

Stamicarbon, B.V.: *See*—
den Otter, Marinus J. A. M.; Hawinkels, Lambertus P. G.; and Schouteten, Augustinus P. H., 4,174,444, Cl. 544-192.000.

Standard Oil Company: *See*—
Veatch, Franklin; and Alford, Harvey E., 4,174,263, Cl. 208-11.0LE.

Standard Oil Company (Indiana): *See*—
Fields, Ellis K., 4,174,447, Cl. 546-109.000.
Zaremba, Hubart B., 4,174,011, Cl. 175-7.000.

Standard Oil Company (Ohio): *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,174,354, Cl. 585-626.000.

Stark, W. Max: *See*—
Hamill, Robert L.; and Stark, W. Max, 4,174,390, Cl. 424-117.000.

Stauffer Chemical Company: *See*—
Gaughan, Edmund J., 4,174,350, Cl. 260-558.00P.

Stauffer, Earl D.: *See*—
Beckman, Daniel L.; and Stauffer, Earl D., 4,174,036, Cl. 206-223.000.

Steen, Donald M. Flame retardant compositions and methods of preparing and using same. 4,174,223, Cl. 106-18.160.

Steiner Corporation: *See*—
Cassia, Antonio M., 4,173,858, Cl. 53-471.000.

Steiner, Gary F.; and Campbell, James F., to Paper Converting Machine Company. Orbital saw sharpening device. 4,173,846, Cl. 51-248.000.

Steingiser, Samuel: *See*—
Salame, Morris; and Steingiser, Samuel, 4,174,043, Cl. 215-1.00C.

Stellar Systems, Inc.: *See—*
Mongeon, Ronald W., 4,174,518, Cl. 340-561.000.
Stelte, David J., to GTE Automatic Electric Laboratories Incorporated. Digital coin circuit. 4,174,468, Cl. 179-6.30R.
Sterling Drug Inc.: *See—*
Mielens, Zigurd E., 4,174,402, Cl. 424-274.000.
Pradt, Louis A.; and Gitchel, Wayne B., 4,174,280, Cl. 210-60.000.
Sternberg, Stanley R., to Environmental Research Institute of Michigan. Parallel partitioned serial neighborhood processors. 4,174,514, Cl. 340-146.3MA.
Steward, Willis G. Receiver for solar energy. 4,173,968, Cl. 126-438.000.
Stewart, Charles W., Sr.: *See—*
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,174,420, Cl. 428-310.000.
Stewart, Donald E.: *See—*
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.
Stewart Stamping Corporation: *See—*
Wolfthal, Maurice, 4,173,824, Cl. 29-783.000.
Stobbs, William M.: *See—*
Matthews, John W., decreased; and Stobbs, William M., 4,174,422, Cl. 428-621.000.
Stockinger, John, to Clayton, John M., Jr.; Berry, W. H., Jr.; and Clayton, John M., III. Bearing puller. 4,173,813, Cl. 29-266.000.
Stournas, Stamoulis, to Mobil Oil Corporation. Polyisocyanate crosslinked alkylene oxide-linear non-ionic polysaccharide reaction product. 4,174,309, Cl. 260-13.000.
Straitz, John F., III. Burner heads for waste combustible gas. 4,174,201, Cl. 431-202.000.
Strang, Charles D., to Outboard Marine Corporation. Two-speed transmission. 4,173,939, Cl. 115-17.000.
Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., to General Electric Company. Annealing synthetic diamond type Ib. 4,174,380, Cl. 423-446.000.
Styck, Wayne G., to Caterpillar Tractor Co. Anti-rattle vehicle door latch mechanism. 4,174,128, Cl. 292-127.000.
Suhr, Robert G.: *See—*
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Sulzer Brothers Limited: *See—*
Bollman, Edwin, 4,174,482, Cl. 290-1.00A.
Sulzer Morat GmbH: *See—*
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred; Gaiser, Willi; Elsasser, Heinrich; Brenner, Wolfgang; and Kress, Hermann, 4,173,873, Cl. 66-125.00R.
Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.
Sumitomo Chemical Company, Limited: *See—*
Fujita, Fumio; Fukami, Kousuke; Fujimoto, Masanori; and Nagase, Tsuneyuki, 4,174,440, Cl. 536-120.000.
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.
Sundstrand Corporation: *See—*
Schmidt, Michael R.; and Reynolds, David W., 4,173,867, Cl. 60-456.000.
Suprapto, Otmax. Washing machine. 4,173,875, Cl. 68-18.00D.
Suzukawa, Kiyomi: *See—*
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, 4,173,821, Cl. 29-574.000.
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, to Nissan Motor Company, Limited. Peak point detector for ionized mass flow rate measurement. 4,173,888, Cl. 73-194.00F.
Swanson, Wesley S.: *See—*
Donahue, William R., Jr.; and Swanson, Wesley S., 4,174,091, Cl. 251-138.000.
Swearingen, Judson S.; and Beeloo, Leendert A. Control system and method. 4,173,870, Cl. 60-702.000.
Swiss Aluminium Ltd.: *See—*
Borer, Werner J.; and Zuzak, Tomas, 4,174,203, Cl. 23-294.00R.
Lenz, Dieter; and Tragner, Erich, 4,174,232, Cl. 148-2.000.
Swodenk, Wolfgang: *See—*
Seifert, Hermann; Waldman, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,174,460, Cl. 568-629.000.
Sylvester, Robert W.: *See—*
Reeves, James W.; Sylvester, Robert W.; and Wells, David F., 4,174,381, Cl. 423-502.000.
Symmes, Russell. Method and apparatus for retreading tires. 4,174,239, Cl. 156-96.000.
Syntex (USA) Inc.: *See—*
Kluge, Arthur F.; and Harrison, Ian T., 4,174,399, Cl. 424-271.000.
Syva Company: *See—*
Ullman, Edwin F.; and Schwarzberg, Moshe, 4,174,384, Cl. 424-8.000.
Tabushi, Iwao; Kato, Hidefumi; Taniguchi, Yoichi; and Kuroda, Yasuhisa, to Tabushi, Iwao. Heavy metal ion adsorbents. 4,174,428, Cl. 525-334.000.
Tachibana, Setsuzo: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Tachibana, Setsuzo; Matsubara, Yuji; and Nagaishi, Hatsuo, 4,173,888, Cl. 73-194.00F.
Tadanier, John S.; Martin, Jerry R.; and Kurath, Paul, to Abbott Laboratories. 4-N-acylfortimicin B derivatives and the chemical conversion of fortimicin B to fortimicin A. 4,174,312, Cl. 260-112.50R.
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing dye fading inhibitors. 4,174,220, Cl. 430-613.000.
Taguchi, Shinichiro, to Tokyo Shibaura Electric Co., Ltd. Composite color signal-handling circuit. 4,174,522, Cl. 358-35.000.
Taig, Alistair G.: *See—*
Morgan, Peter D.; and Taig, Alistair G., 4,174,017, Cl. 180-132.000.
Takada, Syun: *See—*
Taguchi, Masahiko; Mogaki, Katsuo; and Takada, Syun, 4,174,220, Cl. 430-613.000.
Takahashi, Yukio: *See—*
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Takahata, Kosaku, legal successor: *See—*
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Takahata, Kouichi, deceased: *See—*
Daitoku, Kouichi; and Takahata, Kouichi, deceased, 4,174,166, Cl. 354-173.000.
Takama, Teruhiro, to C. Itoh & Co. Ltd.; and Okuda Koki Co., Ltd. Device for measuring rotational speed of a diesel engine. 4,173,896, Cl. 73-518.000.
Takao, Norito: *See—*
Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, 4,174,413, Cl. 428-35.000.
Takasaki, Masami: *See—*
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Takata, Akira: *See—*
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Takaya, Matsufumi: *See—*
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Takayama, Teruo: *See—*
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Takeda, Keiso, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air feed control device. 4,173,864, Cl. 60-276.000.
Takeda, Toshiyuki: *See—*
Murakami, Katsuo; Otani, Mitsuoki; Ito, Hiroshi; Awazu, Kenzo; Ibuki, Sumiaki; and Takeda, Toshiyuki, 4,174,294, Cl. 252-301.40P.
Takyu, Toshiyuki: *See—*
Hashimoto, Mitsuo; Takyu, Toshiyuki; Inoue, Masaru; Takasaki, Masami; and Shiho, Shinho, 4,174,230, Cl. 106-109.000.
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, to Hitachi, Ltd. Semiconductor pressure transducer. 4,173,900, Cl. 73-727.000.
Tanaka, Keiji: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 4,174,215, Cl. 430-68.000.
Taneoka, Masao: *See—*
Kaihara, Takashi; Taneoka, Masao; and Kusaka, Toshitsugu, 4,174,480, Cl. 250-342.000.
Taniguchi, Yoichi: *See—*
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Taylor, Harold M.; and Suhr, Robert G., to Eli Lilly and Company. Herbicidal 1-alkyl-3-phenylpyridinium salts. 4,174,209, Cl. 71-94.000.
Taylor, Harry M.: *See—*
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Taylor, John A.: *See—*
Goldsmith, Sydney A.; Taylor, John A.; and Kleinschafer, Richard, 4,173,859, Cl. 56-330.000.
Teleci, Inc.: *See—*
Pratt, Fred, Jr., 4,174,064, Cl. 236-1.00B.
Telecommunications Radioelectriques et Telephoniques TRT: *See—*
Guidoux, Loic B. Y.; and Renaudat, Jean-Louis, 4,174,489, Cl. 325-320.000.
Telefonaktiebolaget L M Ericsson: *See—*
Broger, Lars I.; and Magnusson, Sten E., 4,174,466, Cl. 179-18.0AD.
Tetra Pak Developpement SA: *See—*
Hoj, Peter, 4,174,200, Cl. 425-376.00A.
Thomas, Eric W.; and Maistros, Thomas J., to Industrial Electronic Rubber Company. Method of making a printing blanket. 4,174,244, Cl. 156-242.000.
Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,174,370, Cl. 422-12.000.
3-in-1, Inc.: *See—*
Owens, Walter K., 4,174,047, Cl. 221-154.000.
Thyssen Industrie AG: *See—*
Kreiskorte, Heinz, 4,173,877, Cl. 72-105.000.
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Tidy, David C.: *See—*
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Timm, Walter C., to Control Data Corporation. Magnetic bubble memory detector-amplifier. 4,174,539, Cl. 365-8.000.

Tischer, Werner: *See—*
Liebert, Karl-Heinz; and Tischer, Werner, 4,174,018, Cl. 180-132.000.

Toki, Naoji, to Mitsubishi Jukogyo Kabushiki Kaisha. Floating-type anti-oil anti-impact and anti-wave barrier. 4,174,185, Cl. 405-27.000.

Toki, Naoji: *See—*
Kasai, Hironao; Fujii, Hitoshi; and Toki, Naoji, 4,174,186, Cl. 405-71.000.

Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
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Taguchi, Shinichiro, 4,174,522, Cl. 358-35.000.

Tolley, William K.; and Nelson, Beckay J., to UOP Inc. Separation of rutile from ilmenite. 4,174,274, Cl. 209-166.000.

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Tolmacheva, Alla P.: *See—*
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.

Tomic, Ernst A., to Du Pont de Nemours, E. I., and Company. High-early-strength phosphate grouting system for use in anchoring a bolt in a hole. 4,174,227, Cl. 106-85.000.

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Tomoshige, Toru: *See—*
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Tonka Corporation: *See—*
Fahrendorf, Curtis H.; and Berckhan, Delmar D., 4,173,840, Cl. 46-202.000.

Torrington Company, The: *See—*
Johnston, Dean E., 4,174,138, Cl. 308-235.000.

Toyo Cloth Co. Ltd.: *See—*
Sasaki, Toshimitsu; Fujita, Keikichi; and Ito, Hajime, 4,174,414, Cl. 428-85.000.

Toyo Kogyo Co., Ltd.: *See—*
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Toyo Soda Manufacturing Co., Ltd.: *See—*
Asami, Shunichi; Seita, Toru; and Shimizu, Akihiko, 4,174,426, Cl. 521-27.000.
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.
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Kato, Yuzo; Ii, Akira; and Oniki, Tetsuya, 4,173,958, Cl. 123-136.000.
Takeda, Keiso, 4,173,864, Cl. 60-276.000.

Tragner, Erich: *See—*
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Tranter, Inc.: *See—*
Roethe, Lester A., 4,173,949, Cl. 122-1.00C.

Trede, Wolfgang: *See—*
Schiessl, Alois; Praehauser, Georg; Badura, Wolfgang; and Trede, Wolfgang, 4,173,931, Cl. 102-90.000.

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Padovese, Aldo A.; Trevisan, Giuseppe M. B.; and Sitar, Emilio C., 4,173,960, Cl. 123-146.50A.

Trimble, Lee E.; and Voorhoeve, Rudolf J. H., to Bell Telephone Laboratories, Incorporated. Formation of cyanate compounds. 4,174,377, Cl. 423-365.000.

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Preziosi, Joseph R.; and Trimmer, Paul A., 4,174,008, Cl. 151-69.000.

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Lendl, Josef, 4,174,182, Cl. 400-124.000.

Trnka, Ralph J.: *See—*
Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., 4,174,142, Cl. 339-5.00R.

TRW Inc.: *See—*
Andrews, James D., 4,174,268, Cl. 204-129.550.

Tschudi, Theodor; and Indebetouw, Guy. Continuous feed holographic correlator for randomly oriented workpieces. 4,174,179, Cl. 356-71.000.

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Inoue, Michihiro; Kimura, Takeji; Sato, Masaharu; and Tsunoo, Masahiko, 4,173,916, Cl. 84-1.090.

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Strong, Herbert M.; Chrenko, Richard M.; and Tuft, Roy E., 4,174,380, Cl. 423-446.000.

Tuithof, Hans H.; and Boerboom, Anne J. H. Mass spectrometer. 4,174,479, Cl. 250-292.000.

Turk, Chester F.: *See—*
Krapcho, John; and Turk, Chester F., 4,174,317, Cl. 260-239.00A.

Turner, Gerald W., to Container Corporation of America. Reclosable dispensing carton. 4,174,041, Cl. 206-611.000.

Tyrer, Richard G.; and Milne, James, to Balfour Beatty Limited. Structures and structural members made wholly or partly of wood. 4,174,412, Cl. 427-297.000.

Uchida, Riichi: *See—*
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Uchiyama, Takashi: *See—*
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Uchtman, Vernon A.: *See—*
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Uematsu, Hiroyuki: *See—*
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Ullman, Edwin F.; and Schwarzberg, Moshe, to Syva Company. Fluorescence quenching with immunological pairs in immunoassays. 4,174,384, Cl. 424-8.000.

Ultra Centrifuge Nederland N.V.: *See—*
Kistemaker, Jacob, 4,174,256, Cl. 176-39.000.

Underwood, William G. E.: *See—*
Barton, Derek H. R.; Sammes, Peter G.; Hewitt, Graham; Looker, Brian E.; and Underwood, William G. E., 4,174,318, Cl. 260-239.00A.

Union Carbide Corporation: *See—*
Bruckert, Walter, 4,174,363, Cl. 261-114.0TC.
Chiu, Herman S., 4,174,368, Cl. 264-561.000.
Marcinkowsky, Arthur E.; Keller, George E., II; and Verma, Surendra K., 4,174,353, Cl. 585-835.000.

Uniroyal, Inc.: *See—*
Bethe, Eugene J., 4,174,415, Cl. 428-90.000.
Little, Julian R.; Nudenberg, Walter; and Rim, Yong S., 4,174,457, Cl. 560-134.000.
Mirtain, Henri J., 4,173,991, Cl. 152-361.0FP.
Relyea, Douglas I.; Hubbard, Winchester L.; and Grahame, Robert E., Jr., 4,174,405, Cl. 424-275.000.

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Agriculture: *See—*
Bell, Edward W.; and Gast, Lyle E., 4,174,329, Cl. 260-22.0XA.
Koritala, Sambasivarao, 4,174,300, Cl. 252-454.000.
Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., 4,174,418, Cl. 428-264.000.

Army: *See—*
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Giacomini, Joseph M.; and Lichy, David E., 4,174,162, Cl. 354-70.000.
Matte, Yvanhoe; and Walker, G. Russel, 4,173,932, Cl. 102-254.000.
Rupp, James A., 4,174,149, Cl. 350-96.330.

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Colombo, Peter; Neilson, Robert M., Jr.; and Becker, Walter W., 4,174,293, Cl. 252-301.10W.
Craig, Edwin R.; and Semken, Robert S., 4,174,190, Cl. 417-50.000.
Oeschger, Joseph E.; and Berkeland, James E., 4,174,145, Cl. 339-94.00A.
Smith, James L.; Helenberg, Harold W.; and Kilsdonk, Dennis J., 4,174,510, Cl. 336-62.000.

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Mueller, Robert L.; and Yasui, Robert K. Method for forming a solar array strip. 4,173,820, Cl. 29-572.000.

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Ford, Richard D.; and Vitkovitsky, Ihor M., 4,174,471, Cl. 200-61.080.
Gardner, Keith L.; and Fujiwara, Goro, 4,174,177, Cl. 356-5.000.
Matsuo, Jon T.; and Boyum, Ronald S., 4,174,084, Cl. 244-149.000.
Moran, Steven E., 4,174,524, Cl. 358-95.000.

U.S. Philips Corporation: *See—*
Chastagnier, Jean; and Massip, Jean C., 4,174,501, Cl. 325-56.000.
Dechering, Johannes A. B.; and Geurts, Martinus F. A. M., 4,174,525, Cl. 358-217.000.
Essers, Wilhelmus G.; Jelmorini, Gerardus; and Tichelaar, Gerrit W., 4,174,477, Cl. 219-121.00P.
Ferrieu, Gilbert M. M., 4,174,467, Cl. 179-18.0HB.
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Panneman, Hendrik, 4,174,006, Cl. 141-87.000.
Peeters, Jozef C. I., 4,174,487, Cl. 313-113.000.
Van Erk, Klaus C.; Ploeger, Marinus; and Von Reth, Peter H., 4,174,490, Cl. 313-480.000.
Van Kempen, Dick; and Quirijnen, Marius, 4,173,927, Cl. 101-93.030.
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Chenausky, Peter P.; Buczek, Carl J.; and Wayne, Robert J., 4,174,504, Cl. 331-94.50Q.

University of Utah: *See—*
Jarvik, Robert K., 4,173,796, Cl. 3-1.700.
Mortensen, J D, 4,173,981, Cl. 128-348.000.

UOP Inc.: *See—*
Antos, George J., 4,174,298, Cl. 252-441.000.
Shoffner, James P., 4,174,351, Cl. 260-582.000.
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Upjohn Company, The: *See—*
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Johnson, Roy A.; and Sih, John C., 4,174,441, Cl. 542-426.000.

Uskokovic, Milan R.: *See—*
Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, 4,174,344, Cl. 260-348.550.

Uzlov, Vitaly M.: *See—*
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Valdespino, Joseph M.; and Brandl, Ronald A. Recreational vehicle leveling and support system. 4,174,094, Cl. 254-86.00H.

Vallee, Robert G.; and Saviano, Arnold P., to George P. Johnson Co. Passenger vehicle applied top container. 4,173,965, Cl. 224-328.000.

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van der Lely, Cornelis. Soil cultivating machines. 4,174,002, Cl. 172-49.000.

Van Dyke Tiers, George: *See—*
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Van Erk, Klaus C.; Ploeger, Marinus; and Von Reth, Peter H., to U.S. Philips Corporation. Cathode-ray tube. 4,174,490, Cl. 313-480.000.

Van Handel, Gerald J.: *See—*
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Van Kempen, Dick; and Quirijnen, Marius, to U.S. Philips Corporation. Printing device. 4,173,927, Cl. 101-93.030.

van Mellaert, Jozef K. E. H.; and van Mellaert, Luc J. P. Device for fastening at least one plate inside an electrolyte bath and for feeding current thereto. 4,174,262, Cl. 204-297.00R.

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van Spankeren, Ulrich: *See—*
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VDO Adolf Schindling AG: *See—*
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Veatch, Franklin; and Alford, Harvey E., to Standard Oil Company. Recovery of bitumen from tar sands. 4,174,263, Cl. 208-11.0LE.

Vecchiarelli, Francis, to Hunter Douglas International N.V. Method and apparatus for forming a metal strip. 4,173,879, Cl. 72-179.000.

Velsicol Chemical Corporation: *See—*
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Verberkmoes, John A., to Bastian Blessing Company, Inc. Folding tray rail bracket. 4,174,086, Cl. 248-242.000.

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Vianova Kunstharz, A.G.: *See—*
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Vignes, Alain, to Societe Franceo-Americaine de Constructions Atomiques-Framatome. Expansion process for reducing the stresses in a seamless metal tube. 4,174,233, Cl. 148-4.000.

Vigo, Tyrone L.: *See—*
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Vinals, Joaquin F.: *See—*
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Sommer, Werner; Vinnemann, Antonius; Walter, Manfred E.; Gaiser, Willi G.; Elsasser, Heinrich K.; Brenner, Wolfgang A. A.; and Kress, Hermann, 4,173,874, Cl. 66-125.00R.

Vinois, Jean-Claude C. L. Fluid pressure measuring device. 4,174,005, Cl. 141-54.000.

Vinokurov, Alexandr A.; Gorbunov, Gennady S.; Korolkov, Anatoly G.; Popov, Jury S.; Rozenfeld, Lev M.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M. Cryogenically cooled electrical machine. 4,174,483, Cl. 310-52.000.

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Vollmer, Erwin H.; and Vollmer, George J., to Vollmer of America Corporation. Cutting teeth for circular saw blades. 4,173,914, Cl. 83-848.000.

Vollmer, George J.: *See—*
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Volpe, John J., Jr. Tablet retaining and dispensing device. 4,174,048, Cl. 221-267.000.

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Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,173,944, Cl. 118-719.000.

Waddington, William T.; and Mazzeo, Charles F., to Amerace Corporation. Circuit panel connector. 4,174,147, Cl. 339-176.0MP.

Wade, Peter C.; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Substituted hydrazino derivatives of benzisothiazole-1,1-dioxides. 4,174,442, Cl. 544-62.000.

Wagner, Kuno: *See—*
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Walker, G. Russel: *See—*
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Wallerstein, Martin A. Bowed skylight. 4,173,854, Cl. 52-200.000.

Wallis, Craig: *See—*
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Wang, Richard H. S.; and Zannucci, Joseph S., to Eastman Kodak Company. Polychromophoric dibenzoxazole ultraviolet stabilizers and their use in organic compositions. 4,174,321, Cl. 548-219.000.

Wang, Su-Yen. Multi-functional suppository encapsulator. 4,174,040, Cl. 206-529.000.

Waryasz, Richard E., to Combustion Engineering, Inc. Coal fired fluid bed module for a single elevation style fluid bed power plant. 4,173,950, Cl. 122-4.00D.

Wasmuth, Edward H.: *See—*
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Watanabe, Sohsuke; and Metsugi, Masahiro, to Hitachi Chemical Company, Ltd. Irrigation system. 4,174,067, Cl. 239-112.000.

Waterhouse, John S.: *See—*
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Watkins, Charles L., to Goodman Equipment Corporation. Shaker conveyor drive mechanism. 4,174,032, Cl. 198-761.000.

Waurick, Bruno G. Method and apparatus for the measurement of alternating-current power in transient and subtransient processes. 4,174,499, Cl. 324-107.000.

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Weiler, David L.: *See—*
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Weiler, Mable E.: *See—*
Campbell, David L., 4,174,096, Cl. 256-24.000.

Weiler, Richard T.: *See—*
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Welch, Clark M.; Danna, Gary F.; and Vigo, Tyrone L., to United States of America, Agriculture. Antibacterial textile finishes utilizing zironyl acetate complexes of inorganic peroxides. 4,174,418, Cl. 428-264.000.

Wellard, Charles L., to American Components Inc. Foil type resistor with firmly fixed lead wires. 4,174,513, Cl. 338-312.000.

Wellman, John G.: *See*—
Whiteside, John V., Jr., 4,173,947, Cl. 119-18.000.

Wells, David F.: *See*—
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Wesselski, Fred A.; and Moore, Irving, Jr. Dry powder mix for frying batter. 4,174,408, Cl. 426-302.000.

Westby, Ray L., to Canadian Patents & Development Limited. Radar altimeter for tropical areas. 4,174,520, Cl. 343-13.00R.

Western Electric Company, Inc.: *See*—
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Westfalia-Werke Franz Knobel & Sohne KG: *See*—
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Westin, Urban: *See*—
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Westinghouse Electric Corp.: *See*—
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DeLong, Daniel L.; and Rich, Edward L., III, 4,173,975, Cl. 128-142.00R.
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Martin, James A., Jr.; Martin, Harry F.; and Berry, William R., 4,173,869, Cl. 60-646.000.
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Weterings, Petrus J. J., to U.S. Philips Corporation. Electric lamp. 4,174,488, Cl. 313-315.000.

Wetzel, Klaus: *See*—
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Whiteside, John V., Jr., to Wellman, John G. Method and apparatus for rearing pigs in cages. 4,173,947, Cl. 119-18.000.

Whiting, Philip C., Jr., to Ludlow Corporation. Package for photographic film and material and powders for making same. 4,174,038, Cl. 206-389.000.

Wiegner, Georg. Two-component container and package. 4,174,035, Cl. 206-222.000.

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Williams, Robert A. Adapter for routing electrical wires. 4,174,146, Cl. 339-143.00R.

Williamson, James E., Jr.: *See*—
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Wilson, Richard A.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,174,286, Cl. 252-174.110.

Winchell, David A.: *See*—
Fowles, Thomas A.; and Winchell, David A., 4,174,238, Cl. 156-69.000.

Windele, Josef, to Siemens Aktiengesellschaft. Device for detachable attachment of a print original to a cylinder. 4,174,176, Cl. 355-110.000.

Winkler, Clifford W. Adjustable shelving system. 4,174,486, Cl. 312-138.00R.

Winkless, Robert A.: *See*—
Pesce, Carl A.; Trnka, Ralph J.; and Winkless, Robert A., 4,174,142, Cl. 339-5.00R.

Wolfthal, Maurice, to Stewart Stamping Corporation. Apparatus for automatically assembling articles, such as clips. 4,173,824, Cl. 29-783.000.

Wolpert, Donald H.: *See*—
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.

Wong, Chak-Kuen: *See*—
Chandra, Ashok K.; Chang, Hsu; and Wong, Chak-Kuen, 4,174,538, Cl. 365-2.000.

Wood, Donald A.: *See*—
Collins, John D.; and Wood, Donald A., 4,174,346, Cl. 260-429.700.

Wunsch, Alfred, to BBC Brown Boveri & Company Limited. Apparatus for high pressure-charging an internal combustion engine. 4,173,868, Cl. 60-612.000.

WWG Industries, Inc.: *See*—
Norris, Alan H.; and Chambley, Phillip W., 4,173,861, Cl. 57-293.000.

Wyss, Walter. Tube coupling. 4,174,125, Cl. 285-110.000.

Xerox Corporation: *See*—
Clausing, Don P., 4,174,102, Cl. 271-35.000.
Frankhuizen, Michiel, 4,174,039, Cl. 206-444.000.
Hamaker, Ralph A.; and Buck, Kenneth J., 4,174,171, Cl. 355-3.0BE.
Hunter, Robert K., Jr.; Grafton, David A.; Lander, Joseph; Merritt, Lauren V.; Stewart, Donald E.; and Wolpert, Donald H., 4,174,174, Cl. 355-39.000.
Lane, John N., 4,174,172, Cl. 355-15.000.
McFarland, Keith E., 4,173,945, Cl. 118-660.000.

Yago, Jeffry R., to Lester Construction Co. Mine car. 4,174,013, Cl. 180-6.200.

Yamada, Hiroyuki, to Olympus Optical Co., Ltd. Tape cassette. 4,174,080, Cl. 242-199.000.

Yamada, Kazuji: *See*—
Tanabe, Masanori; Shimada, Satoshi; Nishihara, Motohisa; Yamada, Kazuji; Matsuda, Yasumasa; Shimazoe, Michitaka; Matsuoka, Yoshitaka; Takahashi, Yukio; Katohgi, Katsuya; and Ai, Mitsuo, 4,173,900, Cl. 73-727.000.

Yamada, Kinsaku; Niida, Chiaki; and Takayama, Teruo, to Hitachi, Ltd. Exhaust-gas recirculation system. 4,173,955, Cl. 123-119.00A.

Yamada, Nobuo: *See*—
Matoba, Yasuo; Kise, Yoshio; Yamada, Nobuo; Hashimoto, Akira; and Nakata, Tetsuya, 4,174,341, Cl. 260-45.70S.

Yamada, Seiji: *See*—
Nanba, Yasuhiro; and Yamada, Seiji, 4,174,160, Cl. 354-24.000.

Yamai, Fumito: *See*—
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,174,425, Cl. 521-56.000.

Yamamoto, Hisao: *See*—
Fukui, Masaru; Ogino, Shigeo; and Yamamoto, Hisao, 4,174,407, Cl. 424-325.000.
Yamamoto, Masatoshi; Makino, Keisuke; Suzukawa, Kiyomi; Nakamura, Souichirou; and Sakai, Kiyomi, to Hitachi, Ltd. Method of producing semiconductor devices. 4,173,821, Cl. 29-574.000.

Yamamoto, Toshio; and Yuge, Shizuo, to Minolta Camera Kabushiki Kaisha. Conductive toner transfer photocopying machine. 4,174,170, Cl. 355-3.0TR.

Yamamoto, Zenzo. Inertia balanced golf club. 4,174,110, Cl. 273-169.000.

Yamane, Michiyoshi: *See*—
Ikeura, Kenji; Saito, Masaki; and Yamane, Michiyoshi, 4,173,956, Cl. 123-119.0EC.

Yamasaki, Kazuto, to Maeda Industries, Ltd. Safety device for use with speed change gear system of a bicycle. 4,174,099, Cl. 267-168.000.

Yamashita, Maki, to Minolta Camera Kabushiki Kaisha. Safety mechanism for cameras. 4,174,168, Cl. 354-206.000.

Yasui, Kazuo. Knot retaining implement for necktie or scarf. 4,173,793, Cl. 2-152.00A.

Yasui, Robert K.: *See*—
United States of America, National Aeronautics and Space Administration; Mueller, Robert L.; and Yasui, Robert K., 4,173,820, Cl. 29-572.000.

Yasuike, Akio; Kataoka, Hiroshi; and Takao, Norito, to Asahi-Dow Limited. Multi-layered molded articles. 4,174,413, Cl. 428-35.000.

Yokota, Akira: *See*—
Komine, Takashi; Yokota, Akira; Nakane, Hisashi; Asumi, Shingo; and Okazaki, Noboru, 4,174,222, Cl. 430-190.000.

Yokota, Tetsuo: *See*—
Kido, Shiro; Yokota, Tetsuo; and Nakahara, Yasuhiro, 4,174,430, Cl. 521-146.000.

Yokoyama, Eiji: *See*—
Mori, Hidetomo; Matsubara, Katsumi; Mishina, Haruo; Arai, Akira; Uchida, Riichi; Yokoyama, Eiji; and Arai, Hajime, 4,174,196, Cl. 418-9.000.

Yonekubo, Ken, to Olympus Optical Co., Ltd. Microscope objective lens system. 4,174,151, Cl. 350-175.0ML.

Yonezawa, Noboru: *See*—
Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, 4,174,211, Cl. 75-0.50B.

Yoshida, Kazuetsu; Seki, Michiharu; Kanehori, Keiichi; Kaneko, Katsuhiro; and Sakurai, Yo, to Hitachi, Ltd. Process for removing sulfur oxides and nitrogen oxides from flue gases. 4,174,373, Cl. 423-239.000.

Young, Paul T. K., to Microwave Development Labs. Four-port magic tee having cavity structure at fourth port. 4,174,507, Cl. 333-122.000.

Youngblood, John W. Motorized bi-fold stepwell cover. 4,174,115, Cl. 280-163.000.

Youngquist, Rudolph W.: *See*—
Garrison, Charles M.; Youngquist, Rudolph W.; and Taylor, Harry M., 4,174,315, Cl. 260-123.500.

Yovan, Alex: *See*—
Campbell, David L., 4,174,096, Cl. 256-24.000.

Yuan, Sun-Shine: *See*—
Bodor, Nicolae S.; and Yuan, Sun-Shine, 4,174,450, Cl. 546-16.000.

Yuge, Shizuo: *See*—
Yamamoto, Toshio; and Yuge, Shizuo, 4,174,170, Cl. 355-3.0TR.

Zahnradfabrik Friedrichshafen AG: *See*—
Liebert, Karl-Heinz; and Tischer, Werner, 4,174,018, Cl. 180-132.000.
Zaikovsky, Gennady S.: *See*—
Nemets, Rusaam S.; Gorbulev, Efim S.; Parygin, Veniamin A.; Kontsov, Jury M.; Moldavanov, Viktor P.; Shaforenko, Mark A.; Ignatiev, Alexei K.; Zaikovsky, Gennady S.; and Volnyakov, Mikhail I., 4,173,878, Cl. 72-137.000.
Zamboni, Valentino: *See*—
Sianesi, Dario; Nelli, Giuseppe; Fontanelli, Renzo; and Zamboni, Valentino, 4,174,461, Cl. 568-582.000.
Zannucci, Joseph S.: *See*—
Wang, Richard H. S.; and Zannucci, Joseph S., 4,174,321, Cl. 548-219.000.
Zaremba, Hubart B., to Standard Oil Company (Indiana). Subsea drilling template with carousel guidance system. 4,174,011, Cl. 175-7.000.
Zepeda, Lamberto C. Rake attachment kit. 4,174,003, Cl. 172-375.000.
Zojirushi Vacuume Bottle Co., Ltd.: *See*—
Shimizu, Masahiro, 4,174,053, Cl. 222-209.000.
Zuzak, Tomas: *See*—
Borer, Werner J.; and Zuzak, Tomas, 4,174,203, Cl. 23-294.00R.
Zyryanova, Galina V.: *See*—
Myzenkov, Felix A.; Klushin, Dmitry N.; Shupikov, Viktor A.; Kaizer, Alexandr A.; Shuklin, Anatoly M.; Deresh, Mikhail D.; Kolbin, Nikolai A.; Tolmacheva, Alla P.; Zyryanova, Galina V.; Uzlov, Vitaly M.; and Shmuelzon, Elka I., 4,174,372, Cl. 423-88.000.
Zytan Thermochemische Verfahrenstechnik GmbH & Co. Kommanditgesellschaft: *See*—
Kienow, Sigismund; and Briem, Karl, 4,174,089, Cl. 249-80.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF NOVEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Kabi: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Dial, Howard S.; Habegger, Henry L.; and Kays, William B., to Webb, Howard D.; and Lockhart, Arthur M. Floating cover for a liquid storage reservoir. Re. 30,146, Cl. 220-219.000.

Elert, Karl: *See—*
Gnyp, Andrew; and Elert, Karl, Re. 30,144, Cl. 113-16.000.

Gnyp, Andrew; and Elert, Karl, to Jos. Schlitz Brewing Company. Apparatus for spin flanging containers. Re. 30,144, Cl. 113-16.000.

Granstrand, Bengt R. G.: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Habegger, Henry L.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

Hanshoff, Gunnar: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Jezl, James L.; and Peters, Edwin F., to Standard Oil Company (Indiana). Melt finishing process for polymers produced by vapor state polymerization processes. Re. 30,148, Cl. 526-65.000.

Jordan, John F.; and Lampkin, Curtis M., to Photon Power, Inc. Method of coating a glass ribbon on a liquid float bath. Re. 30,147, Cl. 65-60.00A.

Jos. Schlitz Brewing Company: *See—*
Gnyp, Andrew; and Elert, Karl, Re. 30,144, Cl. 113-16.000.

Kays, William B.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

Lampkin, Curtis M.: *See—*
Jordan, John F.; and Lampkin, Curtis M., Re. 30,147, Cl. 65-60.00A.

Lockhart, Arthur M.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., to AB Kabi. Preparation of antifibrinolytically active isomer of 4-aminomethylcyclohexane carboxylic acid. Re. 30,149, Cl. 562-507.000.

NCR Corporation: *See—*
Puvogel, John M., Re. 30,150, Cl. 361-152.000.

Olsson, Berit M.: *See—*
Melander, Bengt O.; Hanshoff, Gunnar; Granstrand, Bengt R. G.; and Olsson, Berit M., Re. 30,149, Cl. 562-507.000.

Papineau, Ronald I., to Unique Energy Systems, Inc. Energy generating system. Re. 30,145, Cl. 122-4.00R.

Peters, Edwin F.: *See—*
Jezl, James L.; and Peters, Edwin F., Re. 30,148, Cl. 526-65.000.

Photon Power, Inc.: *See—*
Jordan, John F.; and Lampkin, Curtis M., Re. 30,147, Cl. 65-60.00A.

Puvogel, John M., to NCR Corporation. Inductor drive means. Re. 30,150, Cl. 361-152.000.

Standard Oil Company (Indiana): *See—*
Jezl, James L.; and Peters, Edwin F., Re. 30,148, Cl. 526-65.000.

Stork Amsterdam B.V.: *See—*
Vertegaal, Jacobus G., Re. 30,143, Cl. 101-120.000.

Unique Energy Systems, Inc.: *See—*
Papineau, Ronald I., Re. 30,145, Cl. 122-4.00R.

Vertegaal, Jacobus G., to Stork Amsterdam B.V. Rotation screen printing machine and squeegee device. Re. 30,143, Cl. 101-120.000.

Webb, Howard D.: *See—*
Dial, Howard S.; Habegger, Henry L.; and Kays, William B., Re. 30,146, Cl. 220-219.000.

LIST OF PLANT PATENTEES

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,481, 11-13-79, Cl. 49.000.

Moore, Ralph S. Miniature rose plant. 4,480, 11-13-79, Cl. 7.000.

Moore, Ralph S. Miniature rose plant. 4,484, 11-13-79, Cl. 7.000.

Pan-American Plant Company: *See—*
Petusky, Kerry S., 4,482, Cl. 78.000.
Petusky, Kerry S., 4,483, Cl. 77.000.

Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Golden Bounty. 4,482, 11-13-79, Cl. 78.000.

Petusky, Kerry S., to Pan-American Plant Company. Chrysanthemum named Free Spirit. 4,483, 11-13-79, Cl. 77.000.

University of California, The Regents of the: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,481, Cl. 49.000.

Voth, Victor: *See—*
Bringhurst, Royce S.; and Voth, Victor, 4,481, Cl. 49.000.

LIST OF DESIGN PATENTEES

Amerock Corporation: *See—*
Pittenger, Teresa R. B., 253,380, Cl. D6-86.000.
Tegner, Raymond U. H., 253,381, Cl. D6-97.000.

Artcarved Class Rings, Inc.: *See—*
Glueckselig, Gabrielle, 253,403, Cl. D11-35.000.

Baltare, Gunnar, to Eaton Corporation. Mounting bracket. 253,392, 11-13-79, Cl. D8-354.000.

Bartholomew, Glen W. Grass transplanter. 253,390, 11-13-79, Cl. D8-7.000.

Benson, Mason; and McIntosh, James, to Carolina Enterprises, Inc. Siren attachment for cycle-type vehicles. 253,401, 11-13-79, Cl. D10-120.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Combined dispensing container and holder therefor. 253,394, 11-13-79, Cl. D9-12.000.

Berkline Corporation, The: *See—*
Long, Stapleton, 253,379, Cl. D6-62.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., to National Presto Industries, Inc. Electric pressure cooker. 253,388, 11-13-79, Cl. D7-86.000.

Bristol-Myers Company: *See—*
Berghahn, Walter G.; and Weinstein, Jack, 253,394, Cl. D9-12.000.

Carabetta, Vito J. Automobile body. 253,406, 11-13-79, Cl. D12-90.000.

Carolina Enterprises, Inc.: *See—*
Benson, Mason; and McIntosh, James, 253,401, Cl. D10-120.000.

Carscallen Nursery Label Company: *See—*
South, Leslie E., Jr., 253,389, Cl. D8-1.000.

Caulkett, Lawrence F. Sculpture. 253,405, 11-13-79, Cl. D11-131.000.

Charlton Company, Inc.: *See—*
Spound, Albert M.; and Day, Robert C., 253,377, Cl. D6-36.000.
Spound, Albert M.; and Day, Robert C., 253,378, Cl. D6-36.000.

Conair Corporation: *See—*
Tomaro, Patrick M., 253,387, Cl. D7-59.000.
Tomaro, Patrick M., 253,429, Cl. D28-67.000.

Continental Group, Inc., The: *See*—
Hasegawa, Gary K.; and Mascia, Carmen T., 253,395, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,396, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,397, Cl. D9-131.000.
Corning Glass Works: *See*—
Luzier, Patricia A., 253,386, Cl. D7-39.000.
Cosmos, Pete, Sr.; and Kanne, John T., to True Temper Corporation. Game racket. 253,418, 11-13-79, Cl. D21-212.000.
Day, Edwin A. Timepiece dial. 253,402, 11-13-79, Cl. D10-125.000.
Day, Robert C.: *See*—
Spound, Albert M.; and Day, Robert C., 253,377, Cl. D6-36.000.
Spound, Albert M.; and Day, Robert C., 253,378, Cl. D6-36.000.
Display Corporation International: *See*—
Hornblad, Richard P., 253,376, Cl. D6-25.000.
Dreyer, Paul, to Prestige Group Limited, The. Can opener. 253,391, 11-13-79, Cl. D8-39.000.
Eaton Corporation: *See*—
Baltare, Gunnar, 253,392, Cl. D8-354.000.
ElecTroMation, Inc.: *See*—
Voelkert, Donald F., 253,409, Cl. D13-24.000.
Evans, Harold G. Fastener for reticulate fencing panels. 253,393, 11-13-79, Cl. D8-370.000.
Gatti, Joseph R. Jewelry pendant or similar article. 253,404, 11-13-79, Cl. D11-79.000.
Geli, Georgio. Multiple shelf and cabinet unit. 253,383, 11-13-79, Cl. D6-169.000.
Glassenberg, Marvin. Rack. 253,384, 11-13-79, Cl. D6-186.000.
Glueckselig, Gabrielle, to Artcarved Class Rings, Inc. Ring. 253,403, 11-13-79, Cl. D11-35.000.
Gomez, Jorge J. Periscopic viewing device. 253,414, 11-13-79, Cl. D16-48.000.
Gordon, Robert E. Putting training device. 253,421, 11-13-79, Cl. D21-234.000.
GTE Sylvania Incorporated: *See*—
Marecek, Paul M.; and Shaffer, John W., 253,431, Cl. D48-33.000.
Hale, Stephen D. Mailbox. 253,435, 11-13-79, Cl. D99-29.000.
Hamada, Masanori, to Matsushita Electric Industrial Co. Radio receiver. 253,411, 11-13-79, Cl. D14-68.000.
Harle, Fritz. Metronome. 253,399, 11-13-79, Cl. D10-43.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,395, 11-13-79, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,396, 11-13-79, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., to Continental Group, Inc., The. Can or similar article. 253,397, 11-13-79, Cl. D9-131.000.
Heerlien, John G., to Unitec Corporation. Golfer's tool. 253,420, 11-13-79, Cl. D21-234.000.
Hildebrandt, William J., to Stanley Works, The. Saw buck bracket. 253,428, 11-13-79, Cl. D25-68.000.
Hornblad, Richard P., to Display Corporation International. Display rack for oil cans. 253,376, 11-13-79, Cl. D6-25.000.
Infante, David. Kite. 253,417, 11-13-79, Cl. D21-88.000.
Kanne, John T.: *See*—
Cosmos, Pete, Sr.; and Kanne, John T., 253,418, Cl. D21-212.000.
Kimberly-Clark Corporation: *See*—
Roeder, Robert J., 253,423, Cl. D24-51.000.
Roeder, Robert J., 253,424, Cl. D24-51.000.
Roeder, Robert J., 253,425, Cl. D24-51.000.
Roeder, Robert J., 253,426, Cl. D24-51.000.
Kleen-Rite, Inc.: *See*—
Smith, Robert G., 253,422, Cl. D23-4.000.
Kuo, Chin-Tui. Combined cane and cue stick. 253,419, 11-13-79, Cl. D21-232.000.
Long, Stapleton, to Berkline Corporation, The. Sofa. 253,379, 11-13-79, Cl. D6-62.000.
Luzier, Patricia A., to Corning Glass Works. Decal for culinary ware or the like. 253,386, 11-13-79, Cl. D7-39.000.
MacIntosh, John J. Finger ballpoint pen. 253,416, 11-13-79, Cl. D19-41.000.
Marecek, Paul M.; and Shaffer, John W., to GTE Sylvania Incorporated. Multilamp flashlamp article having combustible member therein. 253,431, 11-13-79, Cl. D48-33.000.
Mascia, Carmen T.: *See*—
Hasegawa, Gary K.; and Mascia, Carmen T., 253,395, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,396, Cl. D9-131.000.
Hasegawa, Gary K.; and Mascia, Carmen T., 253,397, Cl. D9-131.000.
Matsushita Electric Industrial Co.: *See*—
Hamada, Masanori, 253,411, Cl. D14-68.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Takenaka, Kazumasa; and Murakami, Shinzo, 253,412, Cl. D14-70.000.
McIntosh, James: *See*—
Benson, Mason; and McIntosh, James, 253,401, Cl. D10-120.000.
Mittman, Emanuel; and Weitzman, Mark R., to Owens-Corning Fiberglas Corporation. Embossed plastic sheet material. 253,434, 11-13-79, Cl. D92-1.100.
Moore, George C.; Moore, Jodele; and Tipke, James M. Three-wheeled vehicle frame. 253,407, 11-13-79, Cl. D12-112.000.
Moore, Jodele: *See*—
Moore, George C.; Moore, Jodele; and Tipke, James M., 253,407, Cl. D12-112.000.
Morrison, Matthew E. Bilboquet staff. 253,430, 11-13-79, Cl. D21-62.000.
Morrison, Thurber H.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 253,388, Cl. D7-86.000.
Murakami, Shinzo: *See*—
Takenaka, Kazumasa; and Murakami, Shinzo, 253,412, Cl. D14-70.000.
National Presto Industries, Inc.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 253,388, Cl. D7-86.000.
Niemeyer, Robert A.; and Pardo, John, to Procter & Gamble Company, The. Dispensing pump. 253,398, 11-13-79, Cl. D9-276.000.
Nippon Columbia Co., Ltd.: *See*—
Sasaki, Isao, 253,410, Cl. D14-27.000.
Ohie, Yoshihisa; and Yamasaki, Tsutomu, to Sharp Corporation. Electronic hemadynamometer. 253,427, 11-13-79, Cl. D24-17.000.
Owens-Corning Fiberglas Corporation: *See*—
Mittman, Emanuel; and Weitzman, Mark R., 253,434, Cl. D92-1.100.
Owens-Illinois, Inc.: *See*—
Reyda, Theodore M., 253,385, Cl. D7-5.000.
Pardo, John: *See*—
Niemeyer, Robert A.; and Pardo, John, 253,398, Cl. D9-276.000.
Pittenger, Teresa R. B., to Amerock Corporation. Hardware support. 253,380, 11-13-79, Cl. D6-86.000.
Prestige Group Limited, The: *See*—
Dreyer, Paul, 253,391, Cl. D8-39.000.
Procter & Gamble Company, The: *See*—
Niemeyer, Robert A.; and Pardo, John, 253,398, Cl. D9-276.000.
Reyda, Theodore M., to Owens-Illinois, Inc. Glass tumbler. 253,385, 11-13-79, Cl. D7-5.000.
Rival Manufacturing Company: *See*—
Vander Wilt, William W., 253,400, Cl. D10-106.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,423, 11-13-79, Cl. D24-51.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,424, 11-13-79, Cl. D24-51.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,425, 11-13-79, Cl. D24-51.000.
Roeder, Robert J., to Kimberly-Clark Corporation. Sanitary napkin. 253,426, 11-13-79, Cl. D24-51.000.
Sargent, Roy D. Vehicle wheel chock. 253,408, 11-13-79, Cl. D12-217.000.
Sasaki, Isao, to Nippon Columbia Co., Ltd. Phonograph tone arm. 253,410, 11-13-79, Cl. D14-27.000.
Schuler, John H., II. Candle. 253,433, 11-13-79, Cl. D73-1.00R.
Shaffer, John W.: *See*—
Marecek, Paul M.; and Shaffer, John W., 253,431, Cl. D48-33.000.
Sharp Corporation: *See*—
Ohie, Yoshihisa; and Yamasaki, Tsutomu, 253,427, Cl. D24-17.000.
Smith, Robert G., to Kleen-Rite, Inc. Filter for cleaning fluid or the like. 253,422, 11-13-79, Cl. D23-4.000.
Solomon, Charles I. Temple for spectacles. 253,415, 11-13-79, Cl. D16-81.000.
South, Leslie E., Jr., to Carscallen Nursery Label Company. Marker for horticultural items. 253,389, 11-13-79, Cl. D8-1.000.
Spound, Albert M.; and Day, Robert C., to Charlton Company, Inc. Hassock or similar article. 253,377, 11-13-79, Cl. D6-36.000.
Spound, Albert M.; and Day, Robert C., to Charlton Company, Inc. Hassock or similar article. 253,378, 11-13-79, Cl. D6-36.000.
Spruiel, Anthony J. Combined hanging planter and lights therefor. 253,382, 11-13-79, Cl. D6-113.000.
Stanley Works, The: *See*—
Hildebrandt, William J., 253,428, Cl. D25-68.000.
Stevens, James P.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 253,388, Cl. D7-86.000.
Takenaka, Kazumasa; and Murakami, Shinzo, to Matsushita Electric Industrial Co., Ltd. Combined radio and television sound receiver or the like. 253,412, 11-13-79, Cl. D14-70.000.
Tegner, Raymond U. H., to Amerock Corporation. Tissue holder. 253,381, 11-13-79, Cl. D6-97.000.
Tipke, James M.: *See*—
Moore, George C.; Moore, Jodele; and Tipke, James M., 253,407, Cl. D12-112.000.
Tomaro, Patrick M., to Conair Corporation. Coffeemaker. 253,387, 11-13-79, Cl. D7-59.000.
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True Temper Corporation: *See*—
Cosmos, Pete, Sr.; and Kanne, John T., 253,418, Cl. D21-212.000.
Unitec Corporation: *See*—
Heerlien, John G., 253,420, Cl. D21-234.000.
Vander Wilt, William W., to Rival Manufacturing Company. Smoke detector. 253,400, 11-13-79, Cl. D10-106.000.
Vandewater, Lloyd L. Form for a concrete tractor weight. 253,413, 11-13-79, Cl. D15-136.000.
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Weinstein, Jack: *See*—
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Weitzman, Mark R.: *See*—
Mittman, Emanuel; and Weitzman, Mark R., 253,434, Cl. D92-1.100.
Yamasaki, Tsutomu: *See*—
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ISSUED NOVEMBER 13, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

144 4,173,792
152 A 4,173,793
322 4,173,794
425 4,173,795

CLASS 3

1.7 4,173,796
1.912 4,173,797
13 4,173,798

CLASS 4

172.17 4,173,799
207 4,173,800
236 4,173,802
326 4,173,801

CLASS 5

13 4,173,803

CLASS 9

8 P 4,173,804

CLASS 13

26 4,174,462

CLASS 15

97 B 4,173,805
104.06 R 4,173,806
179 4,173,807
316 R 4,173,808
319 4,173,809

CLASS 16

47 4,173,810

CLASS 23

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294 R 4,174,203

CLASS 24

73 SG 4,173,811

CLASS 26

84 4,173,812

CLASS 29

266 4,173,813
417 4,173,814
432.1 4,173,815
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568 4,173,817
571 4,173,818
4,173,819
572 4,173,820
574 4,173,821
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611 4,173,823
783 4,173,824

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CLASS 33

27 C 4,173,829

CLASS 34

15 4,173,830
236 4,173,831

CLASS 35

9 B 4,173,832
22 R 4,173,833
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CLASS 37

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81 4,173,836

CLASS 40

159 4,173,837
366 4,173,838

CLASS 46

74 D 4,173,839
154 4,173,842
202 4,173,840
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CLASS 47

41 R 4,173,843
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CLASS 49

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34 J 4,173,847
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98 R 4,173,849
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281 R 4,173,850
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57 4,173,853
82 4,173,855
125 4,173,856
200 4,173,854
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CLASS 53

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CLASS 55

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354 4,174,205
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CLASS 56

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CLASS 57

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CLASS 60

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456 4,173,867
612 4,173,868
646 4,173,869
702 4,173,870

CLASS 62

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CLASS 68

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202 4,173,890
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304 C 4,173,892
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518 4,173,896
609 4,173,897
611 4,173,898
620 4,173,899
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CLASS 84

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CLASS 85

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CLASS 93

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36.2 4,174,217

CLASS 98

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336 4,173,929

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90 4,173,931
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CLASS 106

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38.6 4,174,225
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CLASS 144

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538 4,174,248
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CLASS 172

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CLASS 173

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CLASS 174

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CLASS 176

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CLASS 242

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CLASS 244

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53 B 4,174,083
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339 4,174,087
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CLASS 249

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29.2 EP 4,174,333
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29.4 R 4,174,310
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397.1 4,174,345
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465.4 4,174,347
544 F 4,174,349
558 P 4,174,350
582 4,174,351
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CLASS 269

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CLASS 270

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CLASS 271

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171 4,174,103
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CLASS 273

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CLASS 325

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CLASS 333

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107 4,174,511

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CLASS 353

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CLASS 364

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CLASS 365

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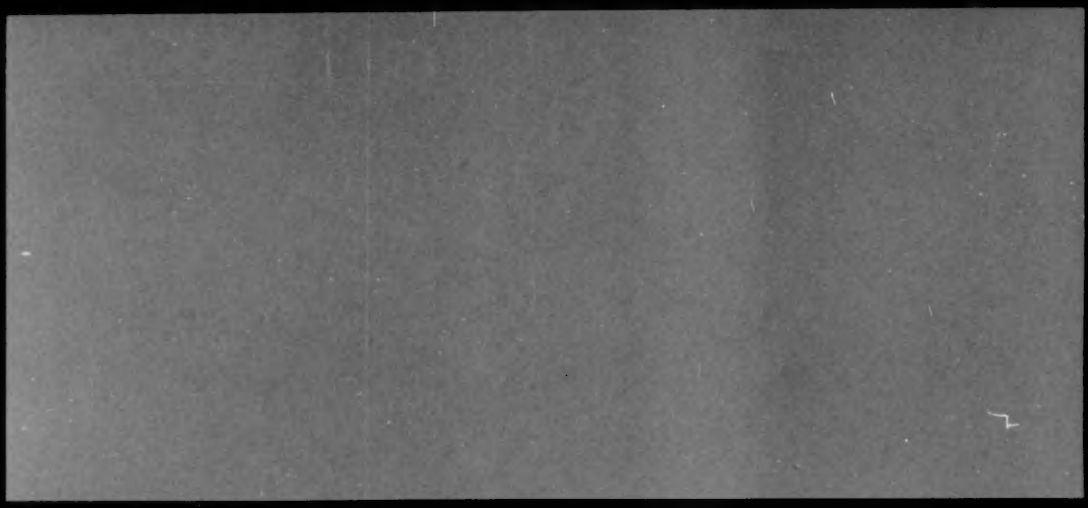

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